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ISSUES AFFECTING ACQUISITION
STRATEGIES FOR REMEDIAL ACTION
PROJECTS AT INSTALLATION
RESTORATION PROGRAM SITES

THESIS

John E. Keoshian, Captain, USAF
William A. Kolakowski, Captain, USAF

AFIT/GEE/CEM/92S-12

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ISSUES AFFECTING
ACQUISITION STRATEGIES FOR REMEDIAL ACTION PROJECTS
AT INSTALLATION RESTORATION PROGRAM SITES

THESIS

Presented to the Faculty of the School of Engineering
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Masters in Engineering and Environmental Management

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September 1992

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Preface

The purpose of this research was to further the Air Force professional's knowledge about problems of cost overruns and time delays associated with environmental contracting. The research was intended to look at the issues surrounding the remedial action projects at Installation Restoration Program sites. The results of this study should help the contracting or engineering professional make decisions regarding the acquisition strategy for a particular environmental restoration.

A list of acronyms used during the contracting of remedial investigations and actions is located on pages vi through ix. Additionally, synopsis of environmental and contracting terms are shown in the Glossary.

We are deeply indebted to Professor Douglas C. Osgood, our advisor, for his guidance and expertise in contracting matters. We also wish to thank William Martin and Robert Wilson for their valuable insight and guidance of environmental matters and writing style. We appreciate all the time and effort they put into making this research a success.

John Keoshian
Bill Kolakowski

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List of Acronyms

A&E	Architect/Engineer
ACC	Air Combat Command
AF	Air Force
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineering Support Agency
AFFARS	Air Force FAR Supplement
AFIT	Air Force Institute of Technology
AFLC	Air Force Logistics Command
AFMC	Air Force Material Command
AMC	Air Mobility Command
ARAR	Applicable or Relevant and Appropriate Requirement
ARCS	Alternative Remedial Contracting Strategy
BOR	Bureau of Reclamation
BRAC	Base Realignment and Closure
CE	Civil Engineering
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COE	Corps of Engineers
CPAF	Cost Plus Award Fee
CPFF	Cost Plus Fixed Fee
CPIF	Cost Plus Incentive Fee

CSI	Construction Specification Institute
DASD(E)	Deputy Assistant Secretary of Defense (Environment)
DBA	Davis Bacon Act
DD	Decision Document
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DFARS	Defense FAR Supplement
DOD	Department of Defense
DODISS	Department of Defense Index of Specifications and Standards
DOE	Department of Energy
DOL	Department of Labor
EO	Executive Order
EIL	Environmental Impairment Liability
EPA	Environmental Protection Agency
ERCS	Emergency Response Cleanup Services
ETCM	Estimated Total Cost Method
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FFA	Federal Facility Agreement
FFP	Firm Fixed Price
FFP-LS	Firm Fixed Price - Lump Sum
FONSI	Finding of No Significant Impact
FPAF	Fixed Price Award Fee
FP-EPA	Fixed Price with Economic Price Adjustment
FPIF	Fixed Price Incentive Firm
FP-LOE	Fixed Price - Level of Effort

GAO	General Accounting Office
GSA	General Services Administration
HAZWRAP	Hazardous Waste Remedial Action Program
HRS	Hazardous Ranking System
HSC	Human Systems Center
HSD	Human Systems Division
HTRW	Hazardous, Toxic and Radiological Waste
HTW	Hazardous and Toxic Waste
IAG	Interagency Agreement
IDIQ	Indefinite Delivery, Indefinite Quantity
IFB	Invitation for Bids
IG	Inspector General
IRP	Installation Restoration Program
M&O	Management & Operations
NAVFAC	Naval Facilities Engineering Command
NCP	National Contingency Plan
NEESA	Navy Emergency and Environmental Service Agency: Existing Technology Guide
NEPA	National Environmental Policy Act
NFA	No Further Action
NFPA	National Fire Protection Association
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Investigation
PL	Public Law
PRP	Potentially Responsible Party

RAC	Remedial Action Contractor
RACER	Remedial Action/Cost Estimating and Risk Model
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RFP	Request for Proposal
RFTP	Request for Technical Proposal
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SCA	Service Contract Act
SDWA	Safe Drinking Water Act
SOW	Statement of Work
SWMU	Solid Waste Management Unit
T&M	Time and Materials
TERC	Total Environmental Restoration Contract
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal
TVA	Tennessee Valley Authority
USACE	US Army Corps of Engineers
USAF	United States Air Force
USGS	US Geological Survey
UST	Underground Storage Tank
VA	Veterans Administration
WESTDIV	Western Division of the Naval Facilities Engineering Command

Abstract

Most, if not all, of Air Force IRP restoration work is accomplished through contracting avenues. The present system of cleanup and close out of these IRP sites is inefficient, time consuming, and costly. Expedient cleanup of contaminated sites will depend in large part upon on how effectively the USAF manages its restoration contracts. Difficulties are encountered due to differences in interpretation and/or vagueness of contracting and environmental information by all parties involved. Additionally, numerous conflicts arise when different agencies apply different acquisition strategies to similar remedial actions. To compound the problem, there are few definitions and little guidance from the Federal Acquisition Regulation and its Supplements relating specifically to environmental restoration work.

To address this problem, an innovative, flexible acquisition strategy is needed. This research considers the contractual factors which affect the selection of an appropriate acquisition strategy. These factors include: method of contracting, specification type, condition of delivery, method of compensation, end purpose, risk associated with environmental remediations, contract management, and various agencies available to execute the contracts.

ISSUES AFFECTING
ACQUISITION STRATEGIES FOR REMEDIAL ACTION PROJECTS
AT INSTALLATION RESTORATION PROGRAM SITES

I. Introduction

General Issue

The United States Air Force (USAF) Installation Restoration Program (IRP) identifies, evaluates, and remediates past hazardous waste, storage, and disposal sites from Department of Defense (DOD) activities (11:4). This program applies to actions at active installations, inactive installations, and non-DOD land affected by DOD wastes. The IRP was established as a result of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, also known as Superfund, and the Superfund Amendments and Reauthorization Act (SARA) of 1986. These laws require federal agencies to identify and remediate hazardous wastes sites that affect, or have the potential to affect human health, welfare, and environment (14:11-12).

Current Situation

Most, if not all, of this IRP restoration work is being accomplished through contracting avenues. Expedient cleanup of contaminated sites will depend in large part upon on how effectively the USAF manages its restoration contracts. The

present system of cleanup and close out of these IRP sites is inefficient, time consuming, and costly (27:2). To address this problem, an innovative, flexible acquisition strategy is needed. This strategy must consider various contractual factors which include: method of contracting, specification type, condition of delivery, method of compensation, end purpose, risk associated with environmental remediations, contract management, and the various agencies available to execute the contracts. The high cost of remedial actions, long delivery times, inefficient procurement procedures, and other problems with IRP contracts are the motivation behind this research.

Cost of Air Force IRP Remedial Actions

According to Mr. Gary D. Vest, Deputy Assistant Secretary for the Air Force for Environment, Safety, and Occupational Health, the proposed budget for AF environmental cleanup and compliance programs is expected to reach \$1.3 billion in fiscal year 1993 (28:8).

This year, DOD will spend about \$1.1 billion on environmental cleanup and \$1.3 billion next year. In the next 10 years, DOD will spend \$20 to \$30 billion to comply with environmental regulations. (28:27-28)

That is a \$200 million increase from FY 1991. Mr. Vest adds that it will take another \$4 billion dollars to close out the 4,300 pollution sites at 190 Air Force and Air National Guard bases by the year 2000 (28:8). That is about \$1,000,000 per pollution site!

Discussion

In the past, USAF environmental managers and contracting officers relied upon acquisition strategies with which they have the most experience and/or knowledge. These were not necessarily the best strategies for the specific environmental restoration projects (41). For example, many bases used a Firm Fixed Price - Lump Sum (FFP-LS) contract for removal of their underground storage tanks (UST). This acquisition strategy was largely chosen due to past experience and because the contracting officers believed the sites had been completely characterized. In addition, contractors perceived minimal financial risk. Accordingly, bids were low. During the typical tank removal project, the contractor frequently found that either the tank was not correctly located, the tank was not of the type specified, or the tank had leaked and the soil surrounding the tank was contaminated. These unexpected findings led to significantly increased costs and long time extensions to the contract.

Environmental managers and contracting officers are now realizing that uncertainties need to be expected in most environmental restoration work (12:3-1). These uncertainties are the primary factor that create risk, either for the contractor or the government, that potentially increases the cost and time needed to complete an environmental restoration contract, especially when

compared to a standard construction contract. Because of the uncertainty involved in typical UST removal/replacement projects, a Fixed Price - Unit Price or a Cost Reimbursement contract might have been more appropriate.

In a Fixed Price - Unit Price contract, line items covering estimated cubic yards of soil removed, cubic yards of contaminated soil removed, permits, and other requirements can be identified in the bid schedule, thus reducing the number of potential modifications by establishing a unit price for these unpredictable items of work. Cost Reimbursement contracts remove some degree of risk from the contractor and place a greater responsibility for uncertainties on the government (12:2-2). As with the Fixed Price - Unit Price contract, the number of modifications can be minimized.

With both of these contracts, the cost for government oversight is increased while the risk to the contractor is decreased. The decreased risk results in reduced costs. The government must weigh this reduction against the increased costs of government oversight and the increased risk placed on the government. This is one example of the complex nature of an environmental contract.

Environmental restoration projects are becoming increasingly diverse, ranging from simple removal actions to multiple-phase cleanups using new, innovative and often complex technologies. Additional difficulties are

encountered due to differences in interpretation and/or vagueness of contracting and environmental information by all parties involved. These issues lead to a lack of sufficient agreement about the information used during the acquisition process. Numerous conflicts arise when different agencies apply different acquisition strategies to similar remedial actions. To compound the problem, there are few definitions and little guidance from the Federal Acquisition Regulation (FAR) and its Supplements relating specifically to environmental restoration work.

Uncertainties of environmental cleanup projects produce a significantly higher risk factor that is not typically found in construction or service contracts. Acquisition strategies typically used for construction and service projects place much of the risk on prospective contractors. The amount of risk placed upon a contractor directly influences the amount of profit/fee that one expects to receive (12:3-4). The higher the risk, the higher the expected return and the greater potential loss. Figure 1. points out the relationship of uncertainty versus risk and compensation of the contractor.

Because this research was based on projects that were or will be completed according to the IRP process, this section contains a brief discussion of the AF IRP process. Next, a definition introduced for the basis of this research, acquisition strategy, is given. Following this,

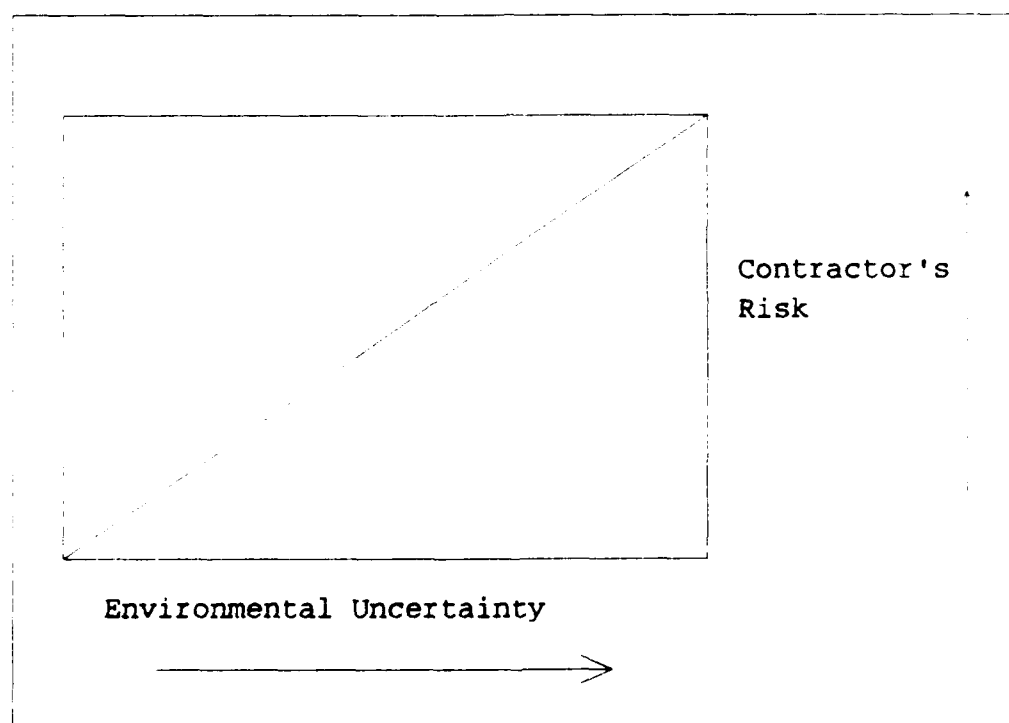


Figure 1. Environmental Contractor's Risk

the Problem Statement identifies the specific research problem that is the focal point of this thesis research. Investigative Questions that were developed to clarify the scope and objective of this research are presented. Next, the Scope of the Research outlines the boundaries of this study. Finally, the General Approach outline of this entire research process is presented.

IRP Process

The DOD instituted in 1980 a comprehensive, on-going environmental program called the Installation Restoration Program. The basic goal of IRP is to cleanup our past environmental mistakes while controlling the migration of hazardous contaminants from these sites (13:3-1). The major cost of the work accomplished at IRP sites is the cost of contaminated soil remediation.

There are three major remedial elements within the IRP process: Preliminary Assessment/Site Inspection (PA/SI), Remedial Investigation/Feasibility Study (RI/FS), and Remedial Design/Remedial Action (RD/RA). The process is further described in Figure 2. The PA portion of the PA/SI includes collecting and reviewing available information (reports, installation records, employee interviews, technical data, etc.) about a known or suspected hazardous waste site or release. The SI consists of a physical inspection of the identified site, and in some cases, sample collection (11:38).

Installation Restoration Program			
Process/Stages			
Validate → as Site	How Dirty/ How to Fix →	The Fix →	Finished
PA/SI Stage	RI/FS Stage	RD/RA Stage	NFA Stage
<ul style="list-style-type: none"> - Discovery & Notification - Preliminary Assessment - Site Inspection - Site Closeout 	<ul style="list-style-type: none"> - Scoping - Development of Alternatives - Characterization - Screening of Alternatives - Detailed Analysis - Selection of Remedy - Decision Document - Site Closeout 	<ul style="list-style-type: none"> - Remedial Design - Remedial Action - Post-Project Activities - Site Closeout 	<ul style="list-style-type: none"> - No Further Action - Site Closeout

Figure 2. Stages of the IRP Process (4:37)

The RI/FS may be conducted concurrently with the PA/SI. The RI consists of sampling and field studies with the goal of determining the nature and extent of contamination at a site and the direction and rate of any identified migration. Such information is necessary to define alternative actions of the FS. The FS is used to develop and analyze various remedial alternatives and recommend appropriate actions. When an action has been chosen, a Decision Document (DD) or Record of Decision (ROD) is written to document the decision (11:38).

The RD/RA is an engineering phase that follows the record of decision. In the RD phase, technical drawings and specifications are developed for subsequent remedial action at an IRP site. The RA is the actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at an IRP site falling under the IRP process (48:D-5).

Definition of Acquisition Strategy

Environmental construction and service requirements within the realm of USAF civil engineering typically necessitate a contract for completion. A contract has several elements that define the acquisition process. The term acquisition strategy is used to identify a specific combination of these contractual elements. These contractual factors include: end purpose, type of

specification, condition of delivery, method of contracting, and method of compensation.

Problem Statement

As stated previously, the present system used to contract for the environmental cleanup and close out of contaminated sites is inefficient, time consuming, and costly. Most of these problems are due to the complexity of environmental restoration work; lack of guidance specific to environmental acquisitions in the Federal Acquisition Regulation and its Supplements; constantly changing federal, state, and local environmental statutes; and the lack of knowledge by the environmental manager/contracting officer.

The primary objective of this research is to further the Air Force professional's knowledge about these problems by gathering and outlining major factors that influence IRP remedial action acquisition strategies. The research will also provide recommendations for further research.

This research will help environmental and contracting professionals become more knowledgeable, and over time, more experienced with the contracting issues that specifically relate to IRP remedial actions. This research is intended to help the environmental and contracting professionals make informed decisions about appropriate acquisition strategies for environmental restoration work.

Investigative Questions

The following investigative questions were addressed in this study:

- 1) What are the acquisition strategies available to the remedial action project manager?
- 2) What are the current predominant acquisition strategies used in remedial action projects?
- 3) What problems does the contracting officer face when determining the appropriate acquisition strategies for remedial actions?
- 4) What service agencies are available to accomplish a selected acquisition strategy for a remedial action?

Scope of the Research

The research considered issues that have been used in determining acquisition strategies for IRP remedial action projects. This research is limited to those federal laws that affect the IRP process; state and local laws were not considered. The research is further confined to remedial action projects, but the analysis of issues relating primarily to other IRP elements was investigated so as to fully understand the remedial action phase. Further, no overseas environmental cleanups were investigated due to the political nature of host nation agreements.

General Approach

Chapter 1 of this document is an introduction of the problem and discusses the uncertainty of environmental contracting. Chapter 2 concentrates on the methodology for data collection, analysis, and review. Chapter 3 discusses the acquisition strategies and issues relating to remedial actions. Chapter 4 is a review of the available contracting vehicles. Finally, Chapter 5 discusses the conclusions, recommendations and areas for possible future research.

II. Methodology

Overview

A thesis is usually defined as a learning experience in which a student carries out an independent research effort in his field and presents the results in a full report (thesis). (8:1)

The study in the field of environmental contracts is in general, very difficult. Although the technical research available from the environmental engineer has been expanding at a fast pace, the foundation of information for environmental management is frequently limited to policy statements, environmental regulations and laws, and technical reports from experts. The information is extremely difficult to comprehend and there are sufficient interpretation conflicts to create an entirely new area of environmental litigation.

The government contract administrator is in a field that is complex and constantly changing. The main sources of information are the Federal Acquisition Regulation (FAR) and its Supplements. These documents are updated on a periodic basis and are difficult to completely comprehend in their entirety due to the depth and breadth of information. The variety of interpretations of the FAR necessitates an appeal system that is regularly used to resolve contract disputes. When combining the two fields of study, an environmental contract administrator confronts a complex,

constantly changing and difficult to interpret foundation of information.

Research Method

The essence of this research was a literature review of documents available on environmental contracting. The research encompassed library searches, database searches, conference attendance, Congressional testimony research, government reports review, and formal classroom education. During the literature review important environmental and contracting terms were identified, and the definitions are located in the Glossary.

Expected Results

The results of this research were expected to be general in concept. The amount of information is large and diverse. The final product discusses the current environmental thinking and produces a foundation of information for other researchers to build upon. Also, the final product contains several concepts for the direction of future research into environmental contracting.

III. Acquisition Considerations

Overview

During this study, many different types of literature, published and unpublished, which dealt with the Air Force Installation Restoration Program (IRP), other federal restoration programs, and contracting processes were reviewed. Literature included textbooks, government reports, congressional testimony, periodicals, briefings, Department of Defense (DOD) and Air Force (AF) Regulations, and Federal laws.

This chapter provides an in-depth look at the acquisition strategies and issues relating to USAF IRP remedial action projects. The areas that would affect the acquisition process are discussed below. They include: regulatory requirements, elements of acquisition strategies, risk allocation, and environmental cost management.

Regulatory Requirements

Federal environmental statutes require United States Government facilities to comply with federal laws and regulations and to comply with all state and local pollution control requirements (49:II-1). For the purposes and discussions of this research, we discuss only Federal Laws and the requirements set forth in the Federal Acquisition Regulation (FAR) and its Supplements.

Federal Laws. The IRP was established as a result of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, also known as Superfund, and the Superfund Amendments and Reauthorization Act (SARA) of 1986 (11:4). These laws required federal facilities to identify and remediate hazardous wastes sites that affect, or have a potential effect on, human health, welfare, and environment. Most federal environmental statutes require users of United States Government facilities to comply with federal laws and regulations. Users will also comply with all state and local pollution control requirements (49:II-1). For the purposes and discussions of this research, regulatory requirements covered include only Federal Laws and the FAR and its Supplements. The CERCLA, SARA, and other major environmental laws and policies affecting the IRP are listed in Figure 3. Brief explanations of these laws and policies can be found in the Appendix.

Acquisition Regulations that Implement Federal Laws.

As previously mentioned, the primary documents governing the acquisition of supplies and services (including construction) for the federal government is the Federal Acquisition Regulation and its Supplements. The FAR is designed to "... ensure that the Government meets its needs in the most effective, economical, and timely manner" (6:2). The FAR is a detailed, lengthy, and complicated document.

- Comprehensive Environmental Response, Compensation, and Liability Act (1980) (CERCLA, Superfund).
- Superfund Amendments and Reauthorization Act of 1986 (SARA).
- National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR part 300.
- Memorandum for the Assistant Secretary of Defense, (Manpower, Reserve Affairs, and Logistics), 20 Nov 81.
- Defense Environmental Quality Control Program Policy.
- Executive Order 12580, Superfund Implementation, 23 Jan 87.
- National Environmental Policy Act of 1969
- Clean Water Act: Originally the Federal Water Pollution Control Act of 1948, extensively amended in 1972 and 1977.
- Safe Drinking Water Act (1974) (SDWA).
- Resource Conservation and Recovery Act of 1976 (RCRA).
- Toxic Substances Control Act (1976) (TSCA).
- Executive Order 12088, Federal Compliance with Pollution Control Standards, 13 Oct 78.
- Executive Order 12316, 14 Aug 81.

Figure 3. Major Environmental Laws and Policies

The FAR is supplemented by the Defense FAR Supplement (DFARS) and the Air Force FAR Supplement (AFFARS). The AFFARS is prefaced with the following point:

The FAR, DFARS, and AFFARS contain direction for Air Force contracting personnel as to (i) what provisions, clauses, and cost principles are authorized for Air Force contracts and (ii) what other procedures and actions they must follow in awarding and administering Air Force contracts. (1:i)

Labor Laws. With regards to application of labor laws to government acquisitions, the laws that have provisions that are applicable to most environmental restorations include the following acts: 1) Contract Work Hours and Safety Standards Act, 2) Walsh-Healy Public Contracts Act, 3) Fair Labor Standards Act, 4) Service Contract Act, and 5) Davis-Bacon Act. These Acts prescribe general policies regarding contractor labor relations as they relate to the acquisition process (15:22.000).

The Contract Work Hours and Safety Standards Act is applicable to laborers and mechanics on all contracts over \$2500 (\$2000 for construction contracts) (15:22.403-3). The Walsh-Healy Public Contracts Act applies to all contracts over \$10,000 for the manufacture or furnishing of materials, supplies, articles, or equipment (15:22.6). The Fair Labor Standards Act is applicable to all government contracts, regardless of size (15:52.222-44). The Service Contract Act (SCA) of 1965 is described under Subpart 22.10 of the FAR. The SCA requires that:

. . . service contracts over \$2,500 shall contain mandatory provisions regarding minimum wages and fringe benefits, safe and sanitary working conditions, notification of employees of the minimum allowable compensation, and equivalent Federal employee classifications and wage rates. (15:22.1002-1)

The SCA also requires contractors to pay their service employees, excluding bona fide executive, administrative or professional employees, at least the wages and fringe benefits deemed appropriate by the Department of Labor for that locality (15:22.1002-2,22.11). The Act is not applicable in several areas. These areas are covered under FAR Part 22.1003-3, Statutory Exemptions.

Finally, the Davis-Bacon Act (DBA) is covered under FAR Subpart 22.4. This subpart governs contracts involving construction. The DBA ensures:

. . . contracts in excess of \$2,000 to which the United States or the District of Columbia is a party for construction, alteration, or repair (including painting and decorating) of public buildings or public works within the United States, shall contain a clause that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the Secretary of Labor. (15:22.403-1)

Wage determinations apply to all laborers and mechanics employed by a contractor upon the site of the work.

Davis Bacon Act vs. Service Contract Act in Environmental Contracting. The determination of the work completed by a remedial action contract is very important. Remedial action is not clearly defined as either construction work or service work. An example of this would be a pump and treat remediation. The SCA does not

specifically exclude the environmental restoration projects. A pump and treat remediation technique could easily fall under the SCA and thus initiating the applicable contract clauses. The construction of the pump and treat remediation technique infrastructure does clearly fall under the DBA and its will require the clauses used for a construction contract.

The Department of Labor (DOL) describes how to determine which Act applies. If the "principle purpose" of the contract is construction or construction accounts for more than 20% of the cost of the contract, then the contract is construction (51:11-12). The definition of what is construction work is also defined by the DOL. The DOL has determined what can be considered construction:

In their determinations of DBA applicability to [Hazardous and Toxic Waste] HTW work, the DOL relies on the regulatory definitions set forth at 29 CFR Part 5. Thus, the statutory terms 'construction, alteration or repair' refer to: '... all types of work done on a particular building or work at the site thereof, including without limitation, altering, remodeling, installation (if appropriate) on the site of the work of items fabricated off-site, painting and decorating, the transportation of materials and supplies to or from the building or work and hauling to an incinerator by the employees of the construction contractor or subcontractor....' DOL has defined 'Building' or 'Work' as follows: '...construction activity as distinguished from manufacturing, furnishing of materials, or services and maintenance work. The terms include without limitation, buildings, structures and improvements of all types, such as... excavating, clearing and landscaping.' (51:13)

This definition can be interpreted to mean that any excavating work or hauling completed by the construction

contractor's employees makes the contract a construction contract. This is consistent with recent contracts established by the Air Force Center for Environmental Excellence (AFCEE). The contracts are construction contracts with the appropriate DBA clauses provided (33).

Enforcement/Administration of Labor Laws. Much of the enforcement of the labor laws is handled by the DOL (35:5.15). Nonetheless, the USAF has certain enforcement responsibilities, and any government employee who is aware of or suspects a violation of any such law is responsible for reporting it to the contracting officer, who will refer the matter to the appropriate authorities (35:5.15).

The Service Contract and Davis Bacon Acts also require monitoring by the contracting agency. Both Acts require inclusion of wage determinations in those contracts which are applicable and the enforcement of minimum wage standards for the employees affected (15:22.404, 22.1002-2). Most of the administration of the Service Contract Act requirements is handled by the DOL. USAF contracting/projects officers, however, are responsible for ensuring that 1) DOL is notified of the existence of all such contracts, and 2) all contractors are fully informed of their responsibilities (15:22).

The Davis Bacon Act, applicable to construction contracts, requires the review of weekly payroll records for all employees (whether employed by the prime contractor or

any subcontractor) to verify compliance with the minimum wage rates and other provisions of the law (15:52.222-6).

Violations of these labor laws may result in suspension of payment, liquidated damages assessment, or ultimately, suspension or debarment of the contractor from receiving future government contracts. Technical personnel who are assigned to monitor contracts with any of these provisions should review the requirements and their own responsibilities with their contracting officers immediately after award.

Elements of Acquisition Strategies

There are various options available to the engineer and the contracting officer when selecting an acquisition strategy for hazardous waste remediation. Most hazardous waste remediations have used well defined specifications and a fixed price contract. As stated previously, this was due to the previous construction experiences within the contracting and engineering offices. Hazardous waste remediation work typically has more design uncertainty than any other type of engineering project, making it difficult to completely define the required work.

Traditionally, government construction contracts are well-defined. Contracts that are well defined typically use a sealed bid type of procurement process with detailed design specifications and are bid on a fixed price - lump sum or unit price basis (55:1031). These contracts place a

substantial amount of risk (for increased costs, time delays, non-performance, etc.) on the contractor (12:2-1).

The government has many options available within the limits of the FAR and its Supplements to select an acquisition strategy for hazardous waste remediation. To determine an optimum strategy for a given requirement, the contracts along with the methods of categorizing contracts need to be understood and analyzed. The methods of categorizing contracts include: end purpose, specifications, conditions of delivery, methods of contracting, and methods of compensation.

End Purpose. To characterize a contract by end purpose one must know the clauses and labor provisions that are to be used. Some of the different types of contracts via end purpose are architect/engineer (A&E), construction, demolition, service, and supply contracts. The typical end purposes used for environmental remediation are A&E, construction, and service. There is a strong tendency for the government to move to a construction type contract.

Specifications. The procedure used to communicate information from the government to the contractor is through written contract documents. The technical information that is required to complete a project is given by specifying the information in the contract documents. The desired remediation technology is determined from the Decision Document (DD) or a Record of Decision (ROD).

Decision Document/Record of Decision . Presently, the DD or ROD is a public document used to explain which cleanup alternative will be used at a site. These documents are not flexible, and thus limit base and contractor decisions on cleanup activities (29). From the time the ROD is signed it may be years until the actual cleanup is started. During this period, many innovative technologies may emerge; but the ROD specifies the who, what, when, where, and why of the cleanup process. Under the present ROD process, all hands are tied at the time of the signing of the ROD. The need for the ROD to be general enough to not overly restrict the remedial action is important to ensure quality and minimize costs (29). The specifications will be generated based upon this document.

Definition of Specifications. The official government definition for specifications is given in the FAR as:

'Specification' means a description of the technical requirements for a material, product or service that includes the criteria for determining whether these requirements are met. Specifications shall state only the Government's actual needs and be designed to promote full and open competition, with due regard to the nature of the supplies or services to be acquired. (15:10.001)

The government has established several mandatory policies for writing specifications. These policies are to ensure that for each contract, there is full and open competition. First, the specifications used by the government must be written as to define the minimum

requirements needed to obtain the desired service or product. Second, the FAR requires the use of mandatory specifications and standards. These specifications and standards are identified in the General Services Administration (GSA) Index of Federal Specifications and the Department of Defense Index of Specifications and Standards (DODISS). If there is a compelling reason, such as lack of time, or unavailability of the desired specification, the specifier may use specifications other than those established by the governments as standard specifications. The FAR also provides exceptions to this mandatory specification rule for construction where nationally recognized industry (or technical source) specifications and standards are available (15:10.006).

Standard Engineering Specifications. The standard procedure for specifying work for construction contracts is to define as completely as possible the specific circumstances surrounding the required work. The Air Force describes a set of specifications as a Statement of Work (SOW). To create this SOW for a construction contract, the government typically uses the Construction Specifications Institute (CSI) Manual of Practice. The CSI manual provides guidance in preparing specifications that are acceptable under the FAR and its Supplements. Additionally, the FAR permits the use of industry specifications or product information when an "or equal" provision is included along

with the specification (15:10.004). Within the CSI there are several ways of specifying required work. Four general categories of specifications are descriptive, performance, reference, and proprietary.

Descriptive Specifications. A descriptive specification is a detailed written description of the work to be completed.

Performance Specifications. Performance specifications describe the desired result and general approach rather than a specific process or design characteristics. A performance specification does not address any approach or process used to meet product requirements, but instead defines the end result that is desired.

Reference Specifications. A reference specification is a reference to a document that is accepted as standard industry practice. Examples of reference specifications include the plumbing code or the National Electric Code.

Proprietary Specifications. A proprietary specification provides specific detail/instruction on the methods and/or materials to be used to accomplish a task. A proprietary specification simply describes a manufacturer's product or method which is the minimum acceptable for the work to be accomplished.

Uncertainty and the Use of Specifications. The normal construction contract that the government uses is very well defined and is usually acquired through a sealed bidding process. A specification used in these circumstances must be as precise as possible. The normal specification should go into great detail on each item specified when sealed bidding is used. When the work that is required to be completed under a government contract becomes difficult to characterize, the specifications becomes less specific in nature. This situation can bring about a greater risk to the contractor if the sealed bidding process is used. Instead of the sealed bidding process, the government may elect to negotiate the contract. The larger the uncertainty the more likely the government will use less specific specifications and also move to a negotiated contract.

Available Standardized Specifications.

Standard Format for Engineering Specifications. The CSI developed a method of organizing specifications in response to a need to be clear and concise. The CSI developed the MASTERFORMAT, which organizes specifications into 16 divisions. The 16 divisions are included in Figure 4. This format allows all parties involved to identify where a specific item is located and prevents the same item being discussed more than once. Within each division, work elements are identified

Division 1	General Conditions
Division 2	Site Work
Division 3	Concrete
Division 4	Masonry
Division 5	Metals
Division 6	Wood and Plastics
Division 7	Thermal and Moisture Protection
Division 8	Doors and Windows
Division 9	Finishes
Division 10	Specialties
Division 11	Equipment
Division 12	Furnishings
Division 13	Special Construction
Division 14	Conveying Systems
Division 15	Mechanical
Division 16	Electrical

Figure 4. MASTERFORMAT Divisions

first in a broad scope, then in a medium scope and finally in a narrow scope. The specifier uses a three part section format, to develop for each element of the work that is applicable. Numerous guide specifications have been developed for many of the elements of work. Some examples are: Corps of Engineers Specifications for Construction, NAVFAC Guide Specification System, and CSI SPECTEXT.

Standardized Environmental Specifications.

There is currently no division for environmental work in the MASTERFORMAT. Also, there are currently no known standardized specifications for environmental work. This lack of standardized specifications for the environmental industry is typical. Most of the standardized specifications used in environmental work have been developed from other specifications within different divisions (32:2). An example of these borrowed specifications is the use of ventilating techniques to remediate a high level of indoor radon gas. In a soil remediation project, the remediation technologies are still in the initial stages and there are few research projects that will completely remediate a site without the total excavation of the site.

The largest percentage of contract disputes that resulted in lost claims are from inadequate and poorly communicative specifications (40:37). Due to the combination of poor specification writing, unknown site

conditions of a typical remedial action project and lack of standardized specifications for environmental work, the typical contract specification can be easily criticized. This results in specifications that are often disputed, resulting in modifications, litigation, and lost claims (unforeseen costs).

Uses of Specifications in Environmental Contracts.

Service contracts for environmental work have the same types of specifications as normal service contracts. The services provided can easily be placed in a statement of work. The environmental construction contract has specifications similar to the typical construction contract. The difference between environmental construction work and the typical construction specification is the site specific specifications. In testimony prepared for the House of Representatives, Subcommittee on Investigations and Oversight, Committee on Public Works and Transportation, Thomas P. Grumbly, President of Clean Sites, describes the uniqueness of remediation sites. He discusses that each remediation site has a specific contract written and, in each contract, the specifications are unique. An effort to standardize specification over the next ten years is underway under the Environmental Protection Agency (EPA). This work is not expected to be completed for 10 years and will not include the newer technologies that will possibly be the best available for remediation work (25:9).

Conditions of Delivery. Conditions of delivery describe the time of delivery or performance and quantities involved in a contract. There are two basic conditions of delivery: definite delivery and indefinite delivery.

Definite Delivery. Definite delivery is used when the exact times and/or quantities of future deliveries are known at the time of contract award.

Indefinite Delivery. There are basically three different forms of indefinite-delivery type contracts. They include: 1) definite quantity contracts, 2) indefinite quantity contracts, and 3) requirements contracts. The appropriate type of indefinite delivery contract depends on whether the exact times and/or quantities of future deliveries or performances are known at the time of contract award (15:16.501).

Definite Quantity. A definite-quantity contract provides for delivery or performance of a definite quantity of specific supplies or services for a fixed period. Deliveries or performance occur at designated locations upon order of the contracting/project officer (15:16.502(a)). This type of contract is particularly suitable for use where it is known in advance that a definite quantity of supplies or services will be required during a specified period and are regularly available or will be available after a short lead time. Advantages of definite quantity contracts are (1) flexibility with respect

to both quantity and delivery scheduling; (2) supplies or services need to be ordered only after actual needs have materialized; (3) the obligation of the government is limited; and (4) it permits stocks to be maintained at minimum levels and allows direct shipment to the user (9:216.502).

Indefinite Quantity. An indefinite-quantity contract provides for an indefinite quantity of specific supplies or services to be furnished during a fixed period, with deliveries or performances to be scheduled by placing orders with the contractor (15:16.504(a)). The contract requires the buyer to order and the contractor to furnish at least a stated minimum quantity of supplies or services and, if ordered, the contractor to furnish any additional quantities, not to exceed a stated maximum (15:16.504(a)). The maximum and minimum quantity, may be expressed in dollars. The maximum quantity represents the government's best estimate of potential need. In appropriate cases the maximum may be raised during the contract period, if justification for using other than full and open competition exists. The minimum must be more than a nominal quantity; yet it should not exceed the amount which is fairly certain to be the minimum quantity. The minimum dollar amount is obligated simultaneously with contract award.

An indefinite quantity contract may be used where it is impossible to determine in advance the precise quantities of

the supplies or services that will be needed during a definite period of time (15:16.504(b)). It is not advisable for the government to commit itself for more than a minimum quantity.

Traditionally, fixed price or fixed rate arrangements have been used in indefinite quantity contracts. In such cases, the solicitation provides for fixed amounts per item specified. Evaluation of proposals for award is based on respective offerors' bid prices per item times the maximum quantity. Other pricing arrangements may be used. These methods include: 1) fixed loaded labor rates in the time and material or labor-hour mode or 2) cost reimbursement.

If time and materials or labor-hour pricing arrangements are used, the indefinite quantity contract has the same disadvantages as those types of contracts. Therefore, it is essential that adequate government surveillance be performed at all times. There are, however, certain advantages to the indefinite quantity contract which make it attractive in some situations. These are: 1) discrete funding with each order, 2) flexibility with respect to both quantities and delivery scheduling, 3) placing orders only as the need arises, 4) flexibility in the types of pricing arrangements selected for use, and 5) the government's legal obligation is limited to contract minimums and delivery orders as issued (9).

Requirements.

A requirements contract provides for filling all actual purchase requirements of specific supplies or services during a contract period with deliveries to be scheduled by the placement of orders to the contractor. (15:16.503(a))

All requirements for the supplies or services covered by this type of contract must be ordered from that contractor, and cannot be procured through any other contracts. This restriction does not apply to the other two types of indefinite delivery contracts.

A realistic estimate of total quantity to be ordered throughout the contract period is stated for the information of prospective contractors. However, the government is not bound by the estimate set forth. The estimate may be obtained from the records of previous requirements and consumption, or by other means. The contract states the maximum limit of the contractor's obligation to deliver and appropriate provisions limiting the government's obligation to order. It may also specify the maximum quantities which may be ordered under each individual order during a specified period of time. Similarly, when small orders are anticipated, the contract may specify the minimum quantities to be ordered. Funds are obligated by each order and not by the contract itself.

A requirements contract may be used for procurement when it is impossible to determine in advance the precise quantities of the supplies and services that will be needed

by the government during a definite period of time.

Advantages of this type of contract are: 1) flexibility with respect to both quantities and delivery scheduling, and 2) supplies or services need be ordered only after actual need has materialized (9:216.2). Generally, the requirements contract is appropriate for use when the item or service is commercially available and when a recurring need is anticipated.

In summary, advantages of a requirements contract are that it is (1) flexible with respect to both quantities and delivery scheduling; (2) supplies or services need to be ordered only after actual needs have materialized; (3) when production lead time is involved, deliveries may be made more promptly because the contractor is usually willing to maintain limited stocks in view of the Government's commitment; (4) price advantages or savings may be realized through combining several anticipated requirements into one quantity procurement; and (5) it permits stocks to be maintained at minimum levels and allows direct shipment to the user (9:216.503).

The majority of the government agencies are accomplishing some environmental restoration work, to include all phases of the IRP, by preplaced contracts. These contracts tend to be delivery order based with an indefinite delivery-indefinite quantity delivery (IDIQ) arrangement.

Methods of Contracting. Basically, there are three methods of contracting that deal primarily with environmental work. They are sealed bidding, two-step sealed bidding, and negotiation (36).

Sealed Bidding. The sealed bidding procedure is the government's procurement method for most civil engineering projects. Sealed bidding involves preparation of Invitation for Bids (IFB), publicizing the contract, accepting bids, opening bids publicly, evaluating the bids (without discussion), and awarding the contract to the lowest responsive and responsible bidder (15:14.101). A responsive bid is one which, to be considered for award, must comply in all material respects with the IFB (15:14.101). This puts all bidders on equal footing for comparison. On the other hand, a responsible bidder is one in which the contractor must have adequate financial resources to perform the contract, be able to comply with the performance schedule, have satisfactory records of performance and integrity, and have the necessary administrative and operational experience (15:9.104-1). The Sealed Bidding procedure is a one shot deal which limits the governments and bidder's options.

A modified type of sealed bidding is the Estimated Total Cost Method (ETCM). This method is used by the Omaha District of the Corps of Engineers and is used in various

types of construction work. This method is further discussed in Chapter 4, Environmental Contracts.

Two-Step Sealed Bidding. The two-step sealed bidding process provides a mechanism for discussion on the technical aspects of a project while retaining the competitive nature of the sealed bid. The process is described in FAR Subpart 14.5. In the first step, the government issues a Request for Technical Proposal (RFTP) describing the project's requirements. Offerors turn in their proposal explaining their approach to the project. The government evaluates the proposal to see if it meets minimum requirements and possibly clarifies the proposals with each of the offerors. The second step is the submission of the sealed bids by the bidders whose technical proposals meet the government's minimum requirements. The government opens the bid publicly and awards the contract to the low bidder (15:14.501(a)-(b)).

The two-step sealed bid provides several advantages and disadvantages. One advantage is the ability of the government to evaluate and clarify proposals (under the sealed bid process this would not be possible). In addition, the process ensures the procurement is competitive through the submission of sealed bids. Finally, it allows the government a means to collect technical information without the use of research and development contracts. One disadvantage is the preparation and review of technical

proposals are time-consuming and costly to both the offeror and the government. The final bids are based on the least costly design, which ensures bidders remain competitive. Also, the government does not have the flexibility to select other than the lowest bid although another package may be technically superior (9).

Negotiated. Any contract awarded without using sealed bidding procedures is a negotiated contract (15:15.101). Negotiation, is similar to the two-step sealed bidding process in that it allows the government and the contractor a means to discuss the project during the procurement process. Unlike the two-step sealed bidding procedure, price can be discussed during negotiations.

Negotiation means contracting through the use of either competitive or other-than-competitive proposals and discussions. First, the government solicits offers by using a Request for Proposal (RFP). Typically, the offerors submit proposals (including price) and the proposals are evaluated to see if they meet minimum requirements. Offerors who meet the minimum requirement are deemed technically acceptable. Negotiation is then conducted with the offerors in the competitive range and then a best and final offer from the offerors is requested. Finally, the selection of the best contractor, not just the lowest price, is made by the contracting officer (15:15.102).

This selection process allows the contracting officer to bring in other criteria to be evaluated. The experience the contractor has had in a particular field, the past quality of work the contractor has completed, and the technology the contractor plans to use are just some of the factors that can be evaluated in negotiations. The guidance for streamline source selection is contained in AFR 70-30.

The RFP process allows the offerors the opportunity to limit their risk by further defining their proposed actions within the technical specifications of the project. The Government has the option under the RFP process to negotiate with the contractors on technical and financial aspects of the project. This allows prospective contractors to seek clarification on the technical aspects of the project that could reduce their risk and consequently their subsequent offer.

Letter Contracts. A letter contract is a written preliminary contract that authorizes the contractor to begin work immediately, before negotiations have been completed and a contract awarded (15:16.603-1). It is used only when the supplies or services are so urgently needed that the government's interests demand that the contractor be given a binding commitment to commence performance.

A letter contract must contain a maximum liability of the government, to cover the estimated amount necessary to cover the contractor's efforts before the contract is

definitized (negotiated and converted to another type of contract). This liability must not exceed 50 percent of the estimated cost of the definitive contract. Definizations of the contract must occur within 180 days after the date of the letter contract or before completion of 40 percent of the work to be performed, whichever occurs first (15:16.603).

Environmental Methods of Contracting. The most advantageous method of contracting for an environmental project is the negotiated method. A remedial action site is often too complicated to be completely and adequately defined by specifications alone. The existence of unknowns is the driving force behind the use of a negotiated contract. This method of contracting is the method of choice for almost all environmental contracts with values above \$5,000,000.

Methods of Compensation. The Federal Acquisition Regulation (FAR) defines the allowable compensation methods that the US Government must use to obtain contractual services. There are two general contract types (with respect to compensation arrangement) available under the FAR: Fixed Price and Cost Reimbursement (15:16). The specific contract types range from firm fixed price (FFP), which the contractor has full responsibility for the performance costs and resulting profit (or loss), to cost plus fixed fee (CPFF), in which the contractor has minimal

responsibility for performance costs and negotiated fee (profit) is fixed (15:16.101(b))).

Fixed Price Contracts. The firm fixed price contract provides for a price which is not subject to any adjustment, regardless of the contractor's cost experienced during performance. This type of contract places the maximum risk on the contractor. In addition, he/she has full responsibility for all costs. These costs have a direct impact on the contractors overall profit or loss. A FFP contract offers maximum incentive for the contractor to control costs and perform effectively and imposes a minimum administrative burden upon the contracting parties (15:16.202-1). This type of contract is used only when definitive specifications or statement of work exists, and a fair and reasonable price can be established prior to award. If major cost uncertainties are present, or definite specifications are not available, a firm fixed price contract may not be awarded (15:16.202-2).

Because the contractor assumes full cost responsibility in a fixed price arrangement, and because this type of contract imposes a minimum administrative burden on both parties, it is the government's preferred method of compensation to use when conditions permit.

In a fixed price contract, the specified price is paid to the contractor when the items called for by the contract have been delivered and accepted. Contract/Project officers

must ensure that they expedite the handling and certification of contractor vouchers, since delays can strain the contractor's financial ability to perform, and can violate the provisions of the Prompt Payment Act.

The government's obligation to make payment under fixed price contracts is expressed in the standard "Payment" clauses (15:52.232). Basically, these clauses provide for payment of the price(s) stated in the contract for supplies delivered and accepted, for services rendered and accepted, construction work accomplished, etc.

The contracting/project officer is responsible for periodically evaluating the contractor's progress to assure that time deadlines are met, and for inspecting the items in order to verify that the quality requirements have been met. The government is entitled to receive exactly what the contract requires, and the standard "Inspection" clauses gives the government the right to accomplish this. However, the clauses also state that the government cannot unnecessarily delay the work by conducting inspections and tests.

The responsibility for acceptance belongs to the contracting officer, unless the contract delegates that authority, in writing, to the project officer. Whoever performs this function must be thoroughly familiar with the specifications or Statement of Work. Acceptance or rejection of all items must take place as soon as possible

after delivery. If a project officer has reason to reject any item, he or she should contact the contracting officer immediately so official notification to the contractor can be made and corrective action can be taken. The contractor must correct the deficiency, or the government has the right either to replace or correct the defective good or services and charge the contractor the cost, or to require delivery of the defective goods at a reduced price. The government also had the right to terminate the contract for default.

As stated above, the firm fixed price of the contract or a particular item in the contract is not subject to adjustment by reason of actual contractor costs. The following situations are the only ones which might cause the price(s) to be adjusted: 1) defective workmanship or material; 2) latent defects; 3) contract modifications; 4) defective pricing data 5) assessment of liquidated damages; 6) variations in quantity in excess of those permitted by the contract; or 7) partial or complete termination of the contract. If any of these situations occur, the contracting officer will modify the contract to reflect a change in the firm fixed price.

Firm Fixed Price, Level of Effort Term

Contracts. This type of contract requires the contractor to provide a specified level of effort, over a stated period of time, on work that can be stated only in general terms. In

addition, the buyer is to pay the contractor a fixed dollar amount (15:16.207).

Fixed Price Contracts with Economic Price Adjustment. A fixed-price contract with economic price adjustment allows flexibility in the stated contract price based upon unexpected occurrences. Economic price adjustments are of three general types: Adjustments based on established prices, adjustments based on actual costs of labor and/or material and adjustments based on cost indexes of labor and/or material (15:FAR 16.203-1).

Fixed Price Incentive Contracts. A fixed price incentive contract is a fixed-price contract that provides for an incentive (more profit) to the contractor. Incentive can be used to motivate the contractor to 1) reduce costs, 2) improve product/service, 3) reduce the delivery time, or 4) all of the above. This contract type establishes target costs (target cost and profit) and a profit adjustment formula. The final price is subject to a price ceiling, negotiated at the outset. The two forms of fixed-price incentive contracts are firm target and successive targets (15:16.403).

Cost Reimbursement Contracts. Cost reimbursement contracts are suitable for use only when uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed price contract. The contracting officer will award a cost

reimbursement type contract when the estimate of total costs negotiated is believed to be reasonable under the circumstances, but because of the degree of uncertainties involved, a fixed price arrangement is not feasible (15:16.301-1). In this situation, the government assumes a greater share of the risk, and pays the contractor the actual allowable costs incurred in the performance of the contract, up to the estimate of total costs established at the time of negotiation. Beyond this amount, the contractor will not be reimbursed and is required to stop work unless additional funds are provided and continued work is authorized by the contracting officer. The contractor must have or establish an accounting system that is acceptable to the government agency before being awarded a cost reimbursement contract.

The government not only assumes most of the cost risk in cost reimbursement contracts, but also incurs other potential disadvantages, as well. A much greater administrative burden is placed upon the government in a cost reimbursement arrangement. Costs must be audited, at a minimum, once before final payment, and a determination must be made that all costs claimed are allowable, allocable, and reasonable. Many times, individual vouchers may be audited. Frequent financial monitoring is also required. Because of these disadvantages, cost reimbursement contracts should be used only when necessary and conditions warrant.

There are five different types of fee structures which are used with cost reimbursement contracts. The three described next are the predominant cost reimbursement contracts used by the service organizations that support the AF. Service organizations which support these activities include the Air Force Center for Environmental Excellence (AFCEE), Corps of Engineers (COE), and Hazardous Waste Remedial Actions Program (HAZWAP) contractors for the Department of Energy (DOE).

Cost Contracts. A cost reimbursement contract in which the contractor receives no fee at all. Generally, such contracts are awarded to educational institutions and other nonprofit organizations. They may also be appropriate for research and development work for facilities contracts. This type of contract is not used for remedial action work (15:16.302).

Cost Plus Incentive Fee Contracts (CPIF). This cost reimbursement form of contract provides a negotiated target cost, target fee, and a minimum and maximum fee. This fee is adjusted by a formula that provides for: 1) "increases in fee above target fee when total allowable costs are less than target costs", and 2) "decreases in fee below target fee when total allowable costs exceed target costs". This gives the contractor an incentive to manage the contract effectively (15:16.404-1).

Cost Plus Award Fee Contracts (CPAF).

A CPAF contract provides for a fee consisting of 1) a fixed base amount which does not vary with performance, and 2) an award pool, the amount of which awarded is based upon a subjective, judgmental evaluation by the government and the contractor's performance. Areas such as quality, timeliness, ingenuity, and cost effectiveness are evaluated by the contracting/project officer in accordance with established criteria. The amount of award fee to be paid is decided at stated intervals (usually every quarter or trimester) during contract performance. The overall objective is to motivate the contractor in a positive way to improve poor performance or to continue good performance. This type of contract is considered for use when the expected effort is anticipated to exceed \$5 million and a cost-reimbursement contract has been selected (15:16.305).

Cost Plus Fixed Fee Contracts (CPFF).

A CPFF contract is the most preferred type of cost reimbursement contract awarded for DOD environmental work (12:2-2). Under this arrangement, the contractor is paid a negotiated fee that is fixed at the inception of the contract. The amount of fee does not vary with actual cost, but stays fixed unless adjusted as a result of changes in the work to be performed. This contract type permits contracting for efforts that might otherwise present too great a risk to the contractors, but it provides the

contractor only a minimum incentive to control costs (15:16.306).

Any of the cost reimbursement contracts listed above can be structured into one of two basic forms: the completion form and the term form (15:16.306(d)). The completion form is one which describes the scope of work to be done as a clearly defined task or job with a definite goal or target and with a specific end product required (15:16.306(d)(1)). This form of contract normally requires the contractor to complete and deliver the specified end product (such as, a final report of an analysis, accomplish the goal or target) as a condition for payment of the entire fixed fee established for the work, ideally within the estimated cost. However, in the event the work cannot be completed within the estimated cost, the government may elect to continue the work without an increase in fee provided it increases the estimated cost.

The term form type of cost reimbursement contract is one which describes the scope of work to be done in general terms and which obligates the contractor to devote a specified level of effort for a stated period of time (15:16.306(d)(2)). Under this form, the fixed fee is payable at the termination of the agreed period of time upon certification by the contractor that it has exerted the level of effort specified in the contract in performing the work called for, and such performance is considered

satisfactory by the government. Extensions in periods of performance or requirements for additional levels of effort are new acquisitions and involve new fee and cost arrangements.

The completion form of contract, because of the differences in obligation assumed by the contractor, is preferred over the term form. Under a completion form contract, prospective contractors are reasonably expected to complete all the work called for by the Statement of Work.

The basic obligation of the government under a cost reimbursement contract is to make payment to the contractor for the costs incurred during performance, plus whatever fee has been negotiated or awarded. The contracting officer must determine the allowable costs in accordance with the principles set forth in FAR Part 31. Specific types of costs are disallowed in these regulations.

Under these principles, the government will also pay the contractor only if the costs claimed are reasonable and allocable. Reasonable costs are those for an amount and type that would be incurred by an ordinarily prudent business person in a competitive business, and must be consistent with the contractor's normal operating practices. Allocable costs include: 1) direct costs or expenses incurred specifically for performance on that contract, and 2) indirect costs, which are expenses which cannot be

assigned directly to a specific contract but which benefit the contract indirectly.

Time and Materials (T&M) Contracts. Time and Materials contracts, FAR 16.601, may be sealed bid or negotiated procurement. The government selects this type of contract when it is not possible at time of contract preparation to estimate the extent or duration of work required.

The time and materials type of contract provides for the procurement of supplies or services on the basis of 1) direct labor hours at specified fixed hourly rates that rates include wages, overhead, general and administrative expense, and profit), and 2) material at cost, and in addition, where appropriate, material handling costs as a part of material costs.
(15:16.601)

Material handling costs may include all indirect costs not included in the labor rates, including general and administrative expense. A variation on the T&M contract is one where fixed rates for equipment are used as well as fixed rates for labor.

This type of contract does not afford the contractor any positive profit incentive to control the cost of materials or to manage its labor force effectively. It is used only where it is not possible at the time of placing the contract to estimate the extent or duration of the work or to anticipate costs with any reasonable degree of accuracy. Particular care should be exercised in the use of this type of contract since its nature does not encourage effective management control. Thus, it is essential that a

T&M contract be used only where provision is made for adequate controls, including appropriate surveillance by government personnel during contract performance to give reasonable assurance that inefficient or wasteful methods are not being used. This type of contract is typically used in the procurement of 1) engineering and design services, 2) repair, maintenance, or overhaul work; and 3) work to be performed in emergency situations.

A T&M contract does not encourage effective cost control and requires almost constant government surveillance; it should be used only after the contracting officer determines that no other type of contract will suitably serve the government needs. It usually requires the daily acceptance of charges by government personnel, who must monitor performance to ensure that charges are appropriate for the work performed (15:16.601(c)).

Labor Hour Contracts. The labor hour type of contract is a variation on the time and materials type of contract, except that materials are not supplied. The contractor is reimbursed strictly on the basis of hours worked at the fixed labor rates specified in the contract (15:16.602).

Liability

CERCLA instituted a national effort to cleanup existing uncontrolled hazardous waste sites within the United States. The work to be completed was to be paid for by those parties

responsible for the creation of the hazardous waste sites. Within CERCLA, section 107 places the burden of the cleanup costs on anyone or organization that had even the slightest participation in the sites creation, operations, or activities. This type of liability is called strict, joint and several liability (40:1-2). This liability has legally placed the cost of cleanup on the organization with the 'deepest pockets' and permits for unfair apportionment of costs.

When a remedial action contractor (RAC) bids or submits a proposal on an environmental restoration project, the RAC automatically falls under section 107 of CERCLA and is thus liable for the costs of the cleanup. Since the RAC accomplishes work that has been funded, there is little risk to them for the specified work. The problem with environmental restoration projects is that there is often unforeseen work that must be completed that was not originally funded. To protect against cost increases due to the unforeseen work, the RAC attempts to obtain private insurance. This insurance is termed Environmental Impairment Liability and costs about \$200,000 each year for \$5,000,000 worth of coverage (19:4). This amount is a percentage of what the typical environmental restoration project costs and will not cover costs for large amounts of additional work. The companies that offer this type of insurance are limited and it is difficult to meet the

eligibility requirements for the insurance (54:1). The additional unknown risk will either increase the cost of the contract or increase the amount of time required to investigate the site to ensure that the risks are minimal. There are several ways of reducing the risk to the RAC: contract selection, bonding, and indemnification.

Bonding. The government under the Miller Act may require that a contractor obtain performance and payment bonds prior to acceptance of that contractor as being responsive. The government requires these bonds for construction projects over \$25,000 (15:28.103-1). The definition of a bond is:

A written instrument executed by a bidder or contractor (the 'principal'), and a second party (the 'surety' or 'sureties'), to assure fulfillment of the principal's obligation to a third party (the 'obligee' or 'Government'), identified in the bond. (15:28.001)

Types of Bonds.

Performance Bonds. A performance bond is used to assure that the contractor performs the contractual agreement. The government has the right to ask for a performance bond amount that it feels is necessary and in the best interest of the government. This amount can be as much as 100% of the original contract price and may increase if during the course of the contract the contract price increases.

Payment Bonds. A payment bond is used to assure the government that the contractor pays their

subcontractors and suppliers. The payment bond is only required when a performance bond is necessary. The amount of the payment bond varies from 50% for contracts less than \$1 million, to 40% for contracts between \$1-\$5 million, to 2½ million for contracts over \$5 million. The required amount of the payment bond can vary if the contract price increases or decreases during the execution of the contract (15:28).

Current Practice in the Construction Industry.

The use of bonds within the construction industry has been a standard with government work. The typical construction contractor can obtain a bond rather easily and become a responsive bidder or offerer on a government contract.

Availability of Bonding for a Typical Construction Contract. In the construction industry, there are bonding agencies that provide guarantees to the government that a contractor will perform in accordance with the contract. To obtain the guarantees, the contractors allow the bonding agency to research their company and determine if the company is credible. The bonding agency will provide surety bonds to the government if it determines that the contractor is an acceptable risk.

Availability of Bonding for Environmental Contracts. Grant Bowers, in his unpublished paper, Effective Use of Bonding Requirements in Air Force Environmental Contracting, points out that since CERCLA/SARA

and the state laws were passed, bonding companies do not use the same process to issue surety bonds for environmental restoration work as they would for typical construction work. Since construction agencies working within the environmental arena are liable for cleanup costs and fines for their work, some contractors have been reluctant to bid on environmental projects because doing so will effectively be gambling with their companies future (5:2;31:3;54:1).

In addition to the reluctance of construction companies to bid on environmental restoration projects, surety companies are not offering surety bonding to the smaller construction companies. Surety companies are generally offering surety bonds to only larger firms that can sustain liabilities under current environmental laws. The result of surety companies not wishing to provide surety bonding to small contractors and the small contractors not wishing to place their company in jeopardy is that many small companies are not entering into environmental restoration work (51:2). With fewer companies involved in environmental restoration, the competition for each project is reduced. Lower competition ultimately increases the overall cost of the contract.

The impact from the unavailability of bonds was evident in the Texas Water Commission Sikes Pit procurement, which was withdrawn when only one of the bidders was able to secure a bond (due to liability and other concerns of the sureties), bringing the initial bid to \$138 million, \$48 million over the agency's design estimate. The rebid had a much lower bonding requirement, drew

research. The Federal Aviation Administration (FAA) was allowed to indemnify the contractors that were responsible for upgrading the country's air traffic control system (26:6-7).

Indemnification's Environmental History. In 1986, SARA added section 119, Response Action Contractors, to the 1980 CERCLA. Section 119 discusses the extent to which a response action contractor can be held responsible for actions he takes during remedial work under the current laws.

(1) In General. — The President may agree to hold harmless and indemnify any response action contractor meeting the requirements of this subsection against liability (including the expenses of litigation or settlement) for negligence arising out of the contractor's performance in carrying out response action activities under this title, unless such liability was caused by conduct of the contractor which was grossly negligent or which constituted intentional misconduct. (46:119(c)(1))

This section is intended to provide financial security to those RACs who, after attempting to obtain commercially available insurance for possible hazardous substance releases, can not obtain said insurance due to unavailability, insufficiency or unreasonable costs (52:46014). This section does not require the government to indemnify the RAC, but it does allow for indemnification. The decision to use section 119 has been delegated to each government agency which is contracting for the services of the RAC.

Analysis of Environmental Indemnification. The financial security for all RACs is found to be important, although not essential, to maintaining a qualified group of RACs for remedial services.

. . .the military departments have not had a problem in obtaining qualified contractors to do the work. We specifically asked Army, Navy, Air Force, and Defense Logistics Agency what their experience has been. They unanimously tell us that their contracting offices report no difficulties in competing their contracts, and are satisfied with the quality of work being done by contractors for DOD's cleanup program. (2:2-3)

The current availability of remedial action contractors is not a surprising situation. Many companies are capable of obtaining the necessary qualifications to pursue government remedial action contracts. These contractors, although completely capable of the work contracted for, are taking a considerable risk that during a catastrophic event could cause severe ramifications for the government. The remedial action contractor must be prepared for the potential of a catastrophic event (26:6-8).

Although there is little trouble maintaining RACs at this time, the loss of a risk transfer vehicle, that not allowing indemnification in a poor commercial insurance period will produce, will force some RACs out of the market (19:2;31:3;43:2;44:4). With fewer qualified RACs competing for the growing number of remedial action contracts, the cost of individual contracts will rise and the total amount of remedial work that can be competed will be reduced. This higher cost for remedial action contracts, while lesser

competition and higher risks are large factors, will also include the cost of obtaining commercial insurance for RACs. This environmental cost for insurance pursuant to the contract is allowable when the insurance is obtained at the market price, and a sound business practice (15:31.205-19).

The alternative of allowing the indemnification of RACs would reduce the risk, increase the competition and remove the cost of commercial insurance. When indemnification is available to RACs, this could result in ". . . saving millions of dollars by not having to reimburse contractors for the cost of pollution liability insurance (or self-insurance)" (52:46016).

Agency's Indemnification Policies. Since each government agency decides whether or not to indemnify a RAC, each agency must create its own standards and rules for indemnifying RACs. The three largest government agencies doing remedial action work with RACs are the Environmental Protection Agency, the Department of Energy, and the Department of Defense. As procedures for indemnification are agency specific, policies can vary all the way from no indemnification at all to full indemnification, or any portion in-between.

EPA. The EPA has established no set rule for indemnifying its RACs. Each project is taken on a case by case basis with some RACs being fully indemnified. On 31 October 1989, the EPA published in the Federal Register a

proposed policy on the indemnification of RACs. The proposed policy did not set forth a clear direction for EPA guidance on indemnification. The proposed policy covered four distinct possibilities that could be used as a final policy on indemnification: 1) No indemnification; 2) Provide indemnification subject to statutory requirements; 3) Offer indemnification with market incentives to purchase commercial insurance; or 4) Provide reinsurance from a commercial insurance pool (EPA Proposal, Federal Register).

At this time there is no clear policy on indemnification established by the EPA, but a large portion of the RACs are fully indemnified (23:35). This trend, although reducing the cost of the contract overhead, has meet with considerable criticism from the GAO. Specific criticisms call for an increase in tracking the efforts of the RACs to obtain commercial insurance. Since the government cannot be obligated for a greater amount then is available in the fund, indemnification is limited to the unobligated amount of funding in a specific program. The current limit on indemnification for all EPA contracts is ". . .all the uncommitted money appropriated by the Congress to Superfund. As of the beginning of fiscal year 1991, the unobligated amount of Superfund was about \$1.75 billion" (23:38).

DOE. Public Law 85-804, National Defense—Contracts defines rules under which a contractor

pursuant to his work for national defense is indemnified by the federal government (45). The DOE uses PL 85-804 to indemnify their Management and Operations (M&O) contractors at hazardous/nuclear waste sites.

This policy has come under considerable criticism from Representative John Dingell (D-Mich). Rep. Dingell claims that the activities under PL 85-804 include only those activities of ". . .national emergencies declared by the Congress or the President, and to Federal agencies who contract work for the purpose of facilitating the prosecution of war" (18:511). A continuing investigation into the indemnification of the management and operations contractors is underway by Rep. Dingell.

The current policy for the DOE is to indemnify "...all contractors at risk from public liability arising from nuclear incident or precautionary evacuations arising out of contractual activities" (17:730). Since the DOE handles 95% of the mixed (nuclear/hazardous) wastes in this country, there is a need for indemnification against mixed waste hazards (53). The standard indemnification policy is to limit the liability of the contractor to the six months of profit. The M&O contractor's fee is evaluated and paid on a six month basis. The maximum profit lost from the M&O contractor is the total of the contract's base and award fees. Any amount over this will be paid for through DOE funds (30).

DOD. Currently the DOD has a policy of not indemnifying any RACs. An interim rule in the DFARS requires the indemnification of the government by the contractor or subcontractor performing hazardous waste treatment of disposal services (9:252.223-7005). The DOD does not agree that it is difficult to obtain qualified contractors for remedial actions when no indemnification for said contractors is available. In proceedings held by Rep. Dingell on 10 March, 1992, several contractors countered this argument as discussed before and urged in their testimony

. . .to indemnify cleanup contractors against the strict, joint and severable liability statutes, and to adopt policies which would limit their liability for negligence to an amount related to the contract fee and to claims arising within a specified time after contract completion. (16:425)

"The industry witnesses warned that DOD's refusal to provide indemnification inhibits them from bidding on DOD environmental cleanup contracts" (16:425).

Since the greatest percentage of cleanup contracts have been other than remedial action, Deputy Assistant Secretary of Defense (Environment), Thomas Baca, will establish a limited test program for remedial action projects. The results of the test program will be used "...to compare various indemnification strategies and the impact they have on DOD cleanups" (2:7).

Environmental Contract Management

The predominant type of contract for large environmental projects is cost reimbursement contracts. Cost reimbursement contracts require an added emphasis on contract management or surveillance to ensure the contractor maintains accurate reimbursable cost records. Since the contractor is being totally reimbursed for all the costs, there is little incentive to control costs. The largest disadvantage to the government when using a cost reimbursement contract is maintaining accurate cost accounting not only on each technical item specified but also on all overhead and allowable expenses of the contractor (12:2-13-17).

The EPA had a large percentage of the initial remedial action contracts, and with this the initial experiences of remedial action construction management. The mandate for the implementation of remedial action contracts comes from Congress through the SARA. Within this mandate, EPA was to start 175 remedial actions by October 16, 1989 and start an additional 200 remedial actions by October 16, 1991 (50:1). The was a very aggressive goal. The problems of its implementation can be seen in Government Accounting Office's (GAO) reports to Congress on the discrepancies in the program. GAO's October 1991 report on the progress of the contract management reflected a "...lack of high-level attention to contract management and delegation of contract

management to regions without sufficient oversight and accountability" (23:7).

The DOE has had considerable work with cost reimbursement type contracts. All of the contracts used at DOE sites are cost reimbursement (24:8). The management of these contracts has been under considerable scrutiny. At the majority of the DOE sites the M&O contractor is a profit-making company. The contracts with the profit-making companies are all cost-plus-award-fee contracts (24:2). The contracts are used to enable the contractor to earn more profit for a higher quality job.

The term quality when associated with a DOE contract is subjective and has been a point of much criticism. The GAO published a report discussing the apparent lack of evaluation apparatus when one contractor, which had originally earned only a satisfactory rating for a six month period, earned a higher rating and received a partial award. The increased rating allowed the contractor to earn over \$1,700,000 from the award base.

Both the EPA and DOE, having considerable experience with cost reimbursement contracts, found it difficult to manage the contract management/surveillance workload. The principle reason is the lack of manning within the organizations. The DOE, in response to criticism from GAO, said they would increase their staff from 1 equivalent manpower position to five (22:6-7). The GAO states in

testimony before congress that "EPA's [inspector general] IG devotes most of its resources to reviews of agency programs and has extremely limited in-house expertise to audit contracts;..." (20:1).

IV. Contracting Vehicles

The Air Force is constrained by law and acquisition regulations in awarding contracts. Government contracting processes are lengthy, particularly if requirements are poorly defined or the contracting officer doesn't understand a specialized process. Determining an appropriate acquisition strategy for a new type of work takes contracting activities a considerable amount of time. The contracting officer must identify the contract organization and demonstrate that the proposed process is workable. Simple and direct procurement methods are best. Typically a contracting officer can award several standard contracts faster than a single unusual contract.

There is a tendency to package sites (turn a group of small projects into a large project). Yet several small projects may be awarded easier and get done faster. Large projects attract more oversight and control. Project grouping should reflect the size of the contractors that will be most competitive for the work at hand. There are several procurement vehicles available to the Air Force. They include a traditional construction agent, the COE or NAVFAC, piggybacking on current indefinite delivery contracts with over government agencies such as DOE or AFCEE. Although these contracts are in place, they add layers of overhead cost and potential delays to the process

because each layer of additional management maintains its established procedures and costs.

The use of these service centers allow for direct use of existing technical talents. It also removes some of the burden of contracting management responsibilities from the base contracting officer/project manager and offers contracting alternatives, other than via an inexperienced AF base contracting officer. Below is a discussion of the Service Agents.

Air Force Center for Environmental Excellence (AFCEE)

The office that initially was responsible for the investigative services for the USAF was the Human Systems Division (HSD) IRP Service Center. HSD, now called the Human Systems Center (HSC), primarily supported the Air Force IRP with five year cost reimbursement type contracts. The Air Force established AFCEE in 1990 to manage and support Air Force environmental programs. HSC is now the contracting office that supports AFCEE. The investigative contracts were set up to include Indefinite Delivery Indefinite Quantity (IDIQ) or Time and Material types of delivery. Each of the ten contracts has a limit of \$50 million over the 5 year contract life. The latest round of investigative contracts were awarded in May of 1990 (4:75-79).

The AFCEE also has remedial design and remedial action contracts. Currently, AFCEE has ten remedial design

contractors on-line for use by IRP project managers. These are \$100 million contracts with an unlimited amount of delivery orders. Several remedial action contracts are expected to be awarded by the end of the 1992 fiscal year. These contracts are technology specific, i.e. pump and treat. The initial remedial action contracts will be for a total of \$200 million and are IDIQ, CPFF contracts. The total amount of remedial action contracts for the AFCEE is expected to exceed \$2 billion (39).

These contracts have been running well and do provide an expedient award and delivery, but they also require a large amount of contract management to ensure costs and schedules are maintained (12:B-2-3). Other advantages of the AFCEE is that the staff is experienced, and the contracts are well written. Additionally, they have established a favorable record for investigations, treatability studies, and designs. Finally, the client has some choice over the A&E firm used.

One drawback of the Air Force Center for Environmental Excellence is that they currently working only IRP sites for bases that are on the base closure list. However, once these projects are initiated and the new contracts are awarded, AFCEE will be able to provide more service for active bases. Another hurdle that AFCEE needs to overcome is on site project management. Unlike the Corps of Engineers, AFCEE does not have experienced 'field office'

personnel available to oversee contract performance. Presently, AFCEE is conducting oversight through their San Antonio office or through its contract with MITRE Corporation. This lack of direct management has caused difficulties when it comes to time sensitive decisions such as modifications and funds management. Again, as AFCEE establishes itself and the new contracts come on line, these problems will be worked out. Overall, if AFCEE continues its present path, it will become the Air Force's primary environmental service center.

US Army Corps of Engineers (USACE)

The USACE, like AFCEE, is an organization that provides environmental services to numerous Air Force Bases. The mission of the USACE is to serve its customers efficiently, to be cost effective, to be competitive, and to perform with the best possible tools (38:2). The Omaha District of the Corps of Engineers (COE) is designated by the USACE as the district responsible for providing nearly all environmental restoration contracts. The Omaha District parallels the USACE with its goals. Omaha believes its critical success factors are marketing, customer satisfaction, leadership by example, enthusiastic people, quality product, and engineering excellence (USACE Brief:3).

One of the positive attributes of the USACE is its ability to provide contracting services in a timely manner. Contracting officers in the Omaha District have various

approval authorities in the arena of Hazardous, Toxic, and Radiological Waste (HTRW). The commander has an unlimited approval authority for HTRW projects and the Chief of Contracting has a \$10,000,000 (unlimited for emergencies) approval authority for HTRW projects. With this delegated authority, the COE is able to provide its customers with timely service.

Other advantages of the COE include some choice by the client on which contractor is used. Technical oversight is good because the Hazardous and Toxic Waste Section of the COE is manned with extremely competent environmental professionals. The COE has good cost control and has a record of being able to obligate money quickly. Financial management is inherent in the COE. This experience/knowledge flowed over from the Military Construction Program.

There are a number of disadvantages in using the Corps of Engineers. The COE has too many clients and communication is slow between the COE and their clients. Although money is obligated quickly, contract tasks are not always negotiated promptly. This delays work, and in FY91 the COE returned funds to Hill AFB at the end of the year, unable to obligate the money for Hill AFB's use (29). The COE is also wary of clients talking directly to contractors, and making modifications to contract tasks can be slow. The pre-placed construction contracts can only be used if an

emergency is justified, otherwise construction must be competitively bid. The pre-placed construction contractors have made proposals that were 2 to 3 times the government estimate. In many cases, the COE negotiates tasks with the contractor without the client being present. In these negotiations, the COE has emphasized areas of their own interest and downplayed their clients interests (29).

The USACE established a contracting strategy solve the long-term contract needs of the IRP and Superfund programs. To enhance this strategy, the COE designed a portfolio of IRP/Superfund contracts to meet the needs of the Department of Defense and outside agencies/companies over the next ten years. The COE intended that this strategy to be the road map for the next decade of IRP/Superfund contracts.

The COE has a number of innovative contracting methods for environmental restoration work. They include: Estimated Total Cost Method (ETCM) Contracts, Cost/Fixed Price Incentive Contracts, Preplaced Contracts, Rapid/Immediate Response Contracts, and Total Environmental Restoration Contracts (TERC). Below is a brief description of these innovative contracting methods.

Estimated Total Cost Method (ETCM). The ETCM was developed by the Omaha District in 1987. Since that time over 60 contracts have been issued with the contract amounts ranging from \$50,000 to \$20,000,000. This contracting method is used in all types of construction work. Over the

past 5 years only three protests were filed and the government prevailed in all three cases.

The ETCM uses a competitive bid process with a formal bid opening. There is a pre-determined formula for evaluation. This evaluation requires no additional time. The ETCM is a fixed price construction contract where the contractor determines the optimum time for completion. The time is equated to cost for evaluation purposes. The contractor declares overhead and these are also equated to cost and time for evaluation. The advantages realized with this method are that there is a more realistic construction schedule. Since the schedule is set by the contractor, the possibility of time disputes is eliminated. Additionally, the contractor competitively predetermines markups. This applies to all modifications and to all below-tier subcontractors thus reducing additional cost markups caused by layers of management and overhead.

The experience to date shows that 80 percent of the contracts were awarded to the actual low bidder, the construction time has been reduced by 25 to 30 percent, and there is a significant savings on modifications. Additionally, there has been no change in the number of bids received (solicitations), no decrease in bid price over conventional bid packages, and no unsatisfactory performance ratings given to date. Finally, modification processing time has been greatly reduced due to the predetermined

markups. There are some cautions that should be noted. The award should not be made if it is impossible to perform the contract within the time bid and the home office overhead or extended overhead is unreasonable.

Some concluding observations about the ETCM are that user comments have been positive. Since service of the COE is its mission, this is extremely important. The Omaha District prefers ETCM over normal IFB, except for renovation work.

Preplaced Remedial Action Contracts. The Preplaced Remedial Action contracts are cost-reimbursable indefinite delivery contracts with maximum amounts of \$50 million per contract. Each contract has the flexibility to accept either fixed-price or cost reimbursement delivery orders. The length of these contracts is one year with four one year options. There is no annual ceiling other than the total \$50 million contract limit. Presently, there are seven national contracts in place.

Rapid/Immediate Response Contracts. The purpose of the Rapid/Immediate Response contracts is to respond to the needs of military installations and the EPA requiring removal actions within 72 hours for the immediate and 45 days for rapid responses. A rapid or immediate response may be required if a spill or leak occurs at an installation that does not have the capability to remediate the site in a

timely manner which the health and welfare of people are affected.

Like the Preplaced Remedial Action contract, the Rapid/Immediate Response Contracts are cost-reimbursable indefinite delivery contracts with maximum amounts of \$50 million per contract. Each contract has the flexibility to accept either fixed-price or cost reimbursement delivery orders. The period of performance for these contracts is one year with four one year options. There is no annual ceiling other than the total \$50 million contract limit. Presently, there are seven national contracts in place.

Total Environmental Restoration Contracts (TERC). The Total Environmental Restoration Contracts are cradle to grave (PA/SI through RA) contracts. These are \$100-200 million cost reimbursable, fixed price, T&M indefinite delivery forms of contracts. They have no delivery order cost limit and the Omaha District has the delivery order approval authority. The length of these contracts is one year with nine one year options. Additionally, there is no limit to the number of delivery orders. The contracts contain construction and service clauses. The COE plans on having four of these contracts on line by 1 Oct 92.

Incineration Contract. Finally, the COE has a multi-phase contract for incineration of toxic waste. The contract has a cost reimbursement or fixed price method of compensation arrangement depending on the requirement. The

COE uses the cost reimbursement contracting provisions for studies relating to the incineration or burning of the contaminated soil. The fixed price contract is used for the design and installation of the portable incinerators and ultimately the burning of contaminated soil.

Department of Energy (DOE)

The DOE established the Hazardous Waste Remedial Actions Program (HAZWRAP) ". . .to develop, promote, and apply innovative and cost-effective waste management and environmental technologies to help resolve the nation's hazardous waste problems and concerns" (12:B-15). The program mainly involves DOD agencies with the majority of the being work investigative in nature. The remedial action projects completed under the program are similar to the emergency response work completed by the EPA and does not encompass projects that are not an immediate threat to human health.

The typical hazardous waste that is produced from DOE activities is what is termed mixed waste. A mixed waste is a waste that is both hazardous and radioactive. The mixed wastes are a considerable problem since the radioactive half-life of some wastes are in the tens of thousands of years. The DOE has established management and operations (M&O) contracts to operate the existing sites. The majority of the contracts are of a cost-plus-award-fee type. There are currently 53 M&O contractors working at the DOE's

various sites throughout the country (24:2). Many sites have changed from a operational status of producing nuclear power or materials to an environmental cleanup status. This change was due to elimination of the national security threats once posed by Eastern-Bloc countries (53).

The environmental work completed at DOE sites is subcontracted to other companies. The GAO has completed several studies and has found that the subcontracting process has been less than appropriate. The major problem with the procurement of subcontractors is the "... inattention to subcontract costs and inadequate justifications for noncompetitive purchases" (21:4).

The principle advantage for the HAZWRAP cost-plus-award-fee contracts is that this form of contract allows for quick obligation of money. However, disadvantages include: no control over contract costs (the cost estimate increases every quarter), the client has no choice in deciding which A&E firm is used. Technical oversight is poor and actual work accomplishment has been difficult (quick to obligate, slow to perform work and expend funds other than for overhead).

DOE has taken the stand that no additional DOD clients will be accepted once the existing contracts are complete. This is a result of the increased IRP workload in DOE. To date, DOE has been slow in getting IRP sites cleaned up, but

the program has improved and is now proceeding satisfactorily.

Naval Facilities Engineering Command (NAVFAC)

The Secretary of the Navy tasked the Naval Facilities Engineering Command (NAVFAC) with the management of the Installation Restoration Program (IRP) for naval installations. NAVFAC manages the IRP through its six geographic Engineering Field Divisions. The Western Division of the Naval Facilities Engineering Command (WESTDIV) developed a new acquisition strategy to meet the secretary's request.

In the early stages of the IRP, WESTDIV used the traditional Brooks Act acquisition strategies to satisfy a growing need for environmental engineering services. Traditional firm fixed price contracts were used for remedial actions and found to be severely limited in their ability to handle expanding scopes, uncertainty of field conditions and multi-year projects. The Navy also felt that construction management of remedial actions required a different type of acquisition strategy.

Under this traditional approach, WESTDIV's first remedial action contracts were indefinite quantity, firm fixed price. This contracting method allowed flexibility in placing delivery orders for new work, but required the scope of each delivery order be negotiated prior to any new field work. Time delays caused by negotiations negated the

reductions in time gained for having a preplaced, multiple delivery order contract.

Since the firm fixed price contracts were not satisfactory, WESTDIV turned to indefinite quantity time and materials contracts for their new requirements. Time and materials contracts resolved the problem of expanding scope by allowing a delivery order to be easily modified to handle the expanded scope. The time and materials type of contract limits the necessity of the contractor to maintain a tight budget. WESTDIV set up the contract for one year with two 1-year options.

The short term of the contract caused another problem because the three years would not be able to span the complete IRP process for a given site. The typical installation restoration process could last 4-8 years from preliminary assessment to remedial design, and another 2 years for the remedial action to be completed. Clearly, with the typical length of the IRP process, two or three contracts of this type would be required to remediate most sites properly.

This "contractor handoff" caused extensive continuity and accountability problems. As one contractor would finish the preliminary assessment, another contractor would be asked to start the remedial investigation/feasibility study portion of the IRP process on the same site. This relieved the first contractor from the responsibility of the accuracy

and completeness of the engineering service provided. These responsibilities now fell upon the next contractor. The consequential burden to validate/invalidate the information provided by the previous contractor increased the time required for completion of the IRP process. The situation was resolved by allowing the second contractor to reaccomplish any controversial work. This rework was costly, time consuming, often conflicting, redundant, and in many cases unnecessary.

Finding these traditional acquisition strategies uncomprehensive, and forced to use multiple contracts on the same project, WESTDIV developed an acquisition strategy more suitable for environmental work. The Comprehensive Long-Term Environmental Action Navy (CLEAN) is a multi-year, cost plus award fee (CPAF) contract designed to span the entire IRP process.

In developing the CLEAN contracts, the Navy looked at several alternatives utilized by other government agencies. The newest contract in this field was then the EPA's Alternate Remedial Contracting Strategy (ARCS), a 10-year, cost plus award fee contract for environmental services. Based on EPA's experience that led to the ARCS, WESTDIV patterned its approach as a cost plus award fee contract. The cost plus aspect of the contract lent itself to handling the problem of expanding scope. The award fee gave incentive to the contractor to ensure quality and cost

effectiveness of the project. While the award fee provided some assurance of the performance, WESTDIV structured the CLEAN contracts for one basic year with nine option years. This allowed the continuation of the contract to be another element in assuring contractor performance while maintaining the continuity of the work.

The CLEAN contract is structured to provide the Navy with the ability to contract for both remedial design and remedial actions. The only restriction is if the CLEAN contractor designs the remedial action, the actual cleanup must be subcontracted because,

No contract for the construction of a project shall be awarded to the firm that designed the project or its subsidiaries or affiliates, except with the approval of the head of the agency or authorized representative. (15:36.209)

Environmental Protection Agency (EPA)

Alternative Remedial Contract Strategy (ARCS). EPA has established a contract for technical and management services at restoration sites. The contract can provide for site management, remedial investigations, remedial designs, contract administration and technical and management assistance to the IRP project site manager from outside the EPA. The contract is a CPAF type contract with a base amount earned when the contract is awarded and an additional award earned based upon performance evaluations.

Base Contracting

Some bases have taken the initiative to contract environmental assessment, investigation, design, and clean-up activities through their own base contracting office. For the most part, this is accomplished at Air Force Material Command (AFMC) bases and the other command bases with large environmental and contracting shops.

For example, at Hill AFB, they have a variety of contracts, generally firm-fixed-price. The obvious advantage is their local control over contracts, costs, etc... Disadvantages are that their project managers have a greater load of a work imposed on them because of the increased workload and the limited manning situation. Additionally, long lead times necessary for competing and awarding contracts can delay obligation of funds.

Another form of contract at Hill AFB is their A&E Indefinite Delivery/Indefinite Quantity contracts. Formerly limited by the Air Force FAR Supplement to \$400,000 per year, \$99,000 per task, and 1 year with a 1 year option. This is a flexible contracting tool that allows low dollar value IRP studies such as PA/SI studies, model development, and risk assessments, but is too small and cannot be used for full RI/FS studies. They are authorized to conduct multiple awards on a single solicitation. The Air Force recently changed their FAR Supplement to raise the limits on these contracts to \$200,000,000 (life of contract), no task

limit, and 1 year with 4 option years. Hill AFB and Wright Patterson AFB have both awarded four contracts using these new limits. Use of these contracts makes task awards a quick process after the contract is awarded. All cost rates are negotiated with the basic contract, so that task awards simply require negotiating hours. However, this decreases flexibility if the project manager wants something for which a rate has not been negotiated.

Many of the AFMC bases have one time firm-fixed price A&E contracts. These contracts have no dollar or time limit. They take considerable time to negotiate, especially if every project is negotiated. Incremental funding of IRP projects and uncertainties in investigations make this vehicle difficult. The AFMC bases have done RI/FS studies in this way.

Hill and Wright Patterson AFBs each have 4 pre-placed construction contractors. These bases are able to compete the construction projects only among those 4 contractors. This amounts to pre-qualifying the construction contractors.

Other Service Agents

US Geological Survey (USGS). The USGS is not really a service agent. They accomplish work (in house) on a cost plus overhead basis. They are used primarily for some remedial investigation and sampling work. They have accomplished a number of underground storage tank projects. Advantages of the USGS include their excellent quality of

investigations, sampling, and modeling efforts. They also are able to obligate funds easily.

US Bureau of Reclamation (BOR). The Bureau of Reclamation is similar to USGS in their capabilities. Future plans of the BOR include the establishing of task order contracts like HAZWRAP and the COE. Their main disadvantage is their lack of experience.

Tennessee Valley Authority (TVA). The TVA is also planning to establish contracts similar to HAZWRAP and the COE.

V. Conclusions and Recommendations

Introduction

The largest factor that drives the cost and length of time for a remedial action is the uncertainty of the location, quantity and toxicity of a contaminant (12:3-1). The main emphasis of this chapter is to discuss how the USAF can mitigate costs and reduce time for a typical remedial action. The conclusions of the research are broken into three sections. The first section, Acquisition Strategy Trends, highlights the acquisition strategies available to the remedial action project manager and the predominant acquisition strategies for remedial action contractors (the first two investigative questions). The second section, Acquisition Strategy Problems, points out the problems facing the contracting officer while determining the appropriate acquisition strategy for a remedial action (the third investigative question). The fourth investigative question is discussed and answered in Chapter 4. Contract Vehicles. The final section, Further Research, discusses possible research into environmental contracting.

Acquisition Strategy Trends

The following section will discuss the current trends in the environmental factors of specifications, methods of delivery, methods of contracting, and methods of compensation. The fifth environmental factor, end purpose,

was analyzed in Chapter 3, and will be discussed only briefly here. The remedial action stage of the IRP process is currently dominated by construction contracts. It should be noted that the clauses used for both the DBA and SCA were found in the remedial action contracts. For the purposes of this discussion, the conclusions will be based on the remedial action stage of the IRP process.

Specifications. The specifications used in the standard construction contract present as much information as possible to the bidder or proposer. The more specific the specifications, the easier it is to quantify the contract in terms of both cost and time. With a very clear and detailed set of specifications, the government can place a large part, if not all, of the risk unto the contractor. Illustrated in Figure 5., the uncertainty involved in a remedial action will not reach a point where the specifications can be complete enough to allow the contractor to accept the full risk of the project. This situation will change. The technology available to completely characterize a remedial action site may be available in the future, but for the current situation of uncertainty, the individual preparing the contract documents for the Air Force must understand that the contract's risk and compensation goes up with the increased uncertainty (Figure 1.).

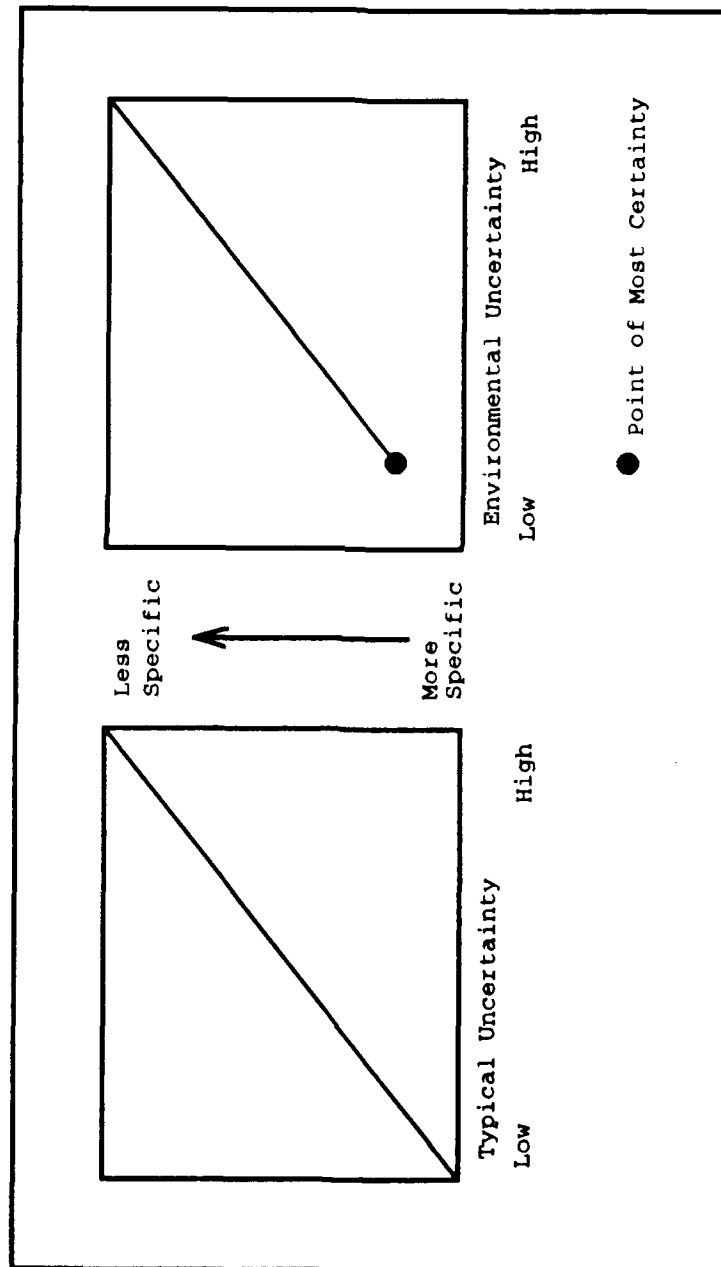


Figure 5. Specifications with Uncertainty

One recommendation regarding specification use is that the Air Force should not continue attempts to fully characterize a remedial action site. This characterization, although essential and necessary to be completed as far as possible, cannot be completed until the technology is available that will fully describe the geology, hydrology, and transport mechanisms of the soils at a remedial action site. As illustrated by the Point of Uncertainty in the Environmental Uncertainty graph in Figure 5., the completely characterized situation is not currently attainable and thus the specifications can not completely describe the project site.

Methods of Delivery. The delivery arrangements of an environmental contract must be tied into the ability to respond to a remedial action in a timely manner. If a site could be completely characterized, and the long lead-time for a definite delivery contract is acceptable, the delivery arrangements would be completely clear. The more uncertain a remedial action site is, the greater the need for contingency arrangements. The ability to have a preplaced delivery system for unknown circumstances reduces the time needed to respond to a priority response action.

There are several recommendations for methods of delivery. The USAF should move towards the ability to complete remedial actions on an indefinite delivery order basis because the time required to contract each IRP site

causes unnecessary delays. This situation is currently available at several large bases with large environmental budgets and programs. The AFCEE and the COE have or will have in the near future several contracts that provide certain remedial action technologies on a IDIQ delivery order basis. The USAF bases without large environmental programs should, at a minimum have within their environmental contracts identified any suspected problems and the ability to have these problems corrected without the requirement to renegotiate the contract. This can be accomplished easily for a wide variety of projects under and IDIQ contract or a requirements contract for a single remediation.

Methods of Contracting. The usual construction contract has been contracted using the sealed bidding process. The uncertainty of standard construction is relatively low and can be accommodated for by simply adding a small percentage to the contract to handle any contingencies. The cost of contingencies within a remedial action can account for much more than a small percentage of the original. The uncertainty of the remedial actions, as discussed before in the Specifications section of this chapter, forces the contracting officer away from the sealed bidding process.

The FAR allows for other than sealed bidding in competitive contracts only in certain circumstances. These

circumstances would include the following: time does not permit for proper solicitation of a contract, the award is not only based upon costs but on other factors as well, a discussion is required with the prospective contractors, or there is an expectation that only one contractor will bid on the project (15:6.401)

The need to use other than cost in the awarding of environmental work also forces the contracting officer to use a other than a sealed bidding process to contract for remedial actions. The importance of ensuring the contractor understands the work entailed in the remedial action is enough to direct the contracting officer not to use the sealed bidding process.

Recommendations for methods of contracting involve the following. The contracting officer must understand that the communication between the contractor and the technical personnel must be a close one. An adversarial relationship in a remedial action project will have the same effect as in a typical construction project; ultimately becoming costly and time consuming. The difference is that the remedial action project can have additional costs if not completed in an efficient and effective manner. A teamwork approach is needed to overcome the uncertainties of a remedial action project.

Methods of Compensation. The compensation arrangement employed by the predominant portion of the large remedial

action contracts is cost-reimbursement. This method of compensation is appropriate since the uncertainty of environmental projects forces the fixed price method of compensation to become costly for a remedial action project.

Recommendation for methods of compensation should follow the lead of the AFCEE and the COE. Both use cost-reimbursement contracts for their initial series of remedial action contracts. The USAF should follow these examples and continue to develop the necessary skill to accomplish the uncertain environmental remedial action contracts using a cost-reimbursement method of contracting.

Acquisition Strategy Problems

This section discusses the problems that can affect a remedial action project. These problems must be taken into account when deciding the appropriate acquisition strategy.

Liability. The typical construction contractor, when offering or bidding a project, places a certain amount of liability upon the company. As shown in Figure 6., the liability for each contract will stop once the contract is completed. The contractor is only liable over the period of the contract. The contractor must pursue the completion of the contract or be found liable for any part that is not completed. The government requires that there is some type of insurance against the possibility of the contractor not completing the contracted work. The usual method for this is through bonding and sureties. At the completion of the

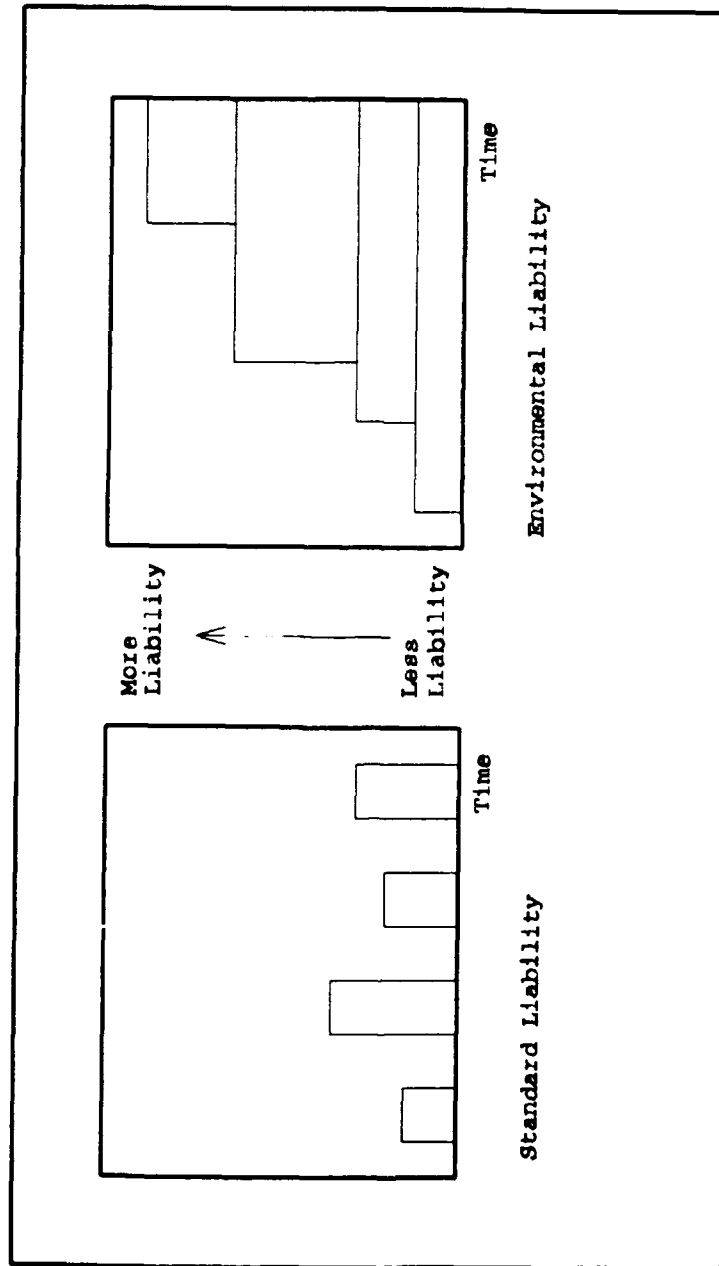


Figure 6. Liability in Contracting

contract, to include all warranties by the contractor, the contractor is relieved of this liability and can pursue other work with a low probability of any harm being placed upon that company from previously completed work.

The environmental contractor does not share the same liability limitations. Current federal laws provide that any work completed by the contractor can come under strict, joint and several liability or third party law suits if there are further problems at the remedial action site. This increased potential liability does not terminate at any point in the future. The liability for an environmental contractor is additive and may make obtaining future bonding difficult. The bonding and surety companies do not provide for insurance beyond the completion of a remedial action project. The environmental contractor is at a distinct disadvantage. Figure 6. graphically shows how this unlimited liability can grow to a point where the contractor's resources will not be able to cover a possible, although highly improbable, environmental cleanup.

There are ways to limit the liability that an environmental contractor takes upon themselves. The USAF, along with the DOD, has the authority to mitigate this liability situation through indemnification. Indemnification will release the contractor from liability other than gross negligence. Two methods of indemnification could be used to prevent a drawdown of available

environmental contractors. The first method is to limit the dollar amount to which the contractor is liable. A second method is to limit the time that the contractor will be liable. Both situations are graphically shown in Figure 7. The reduction of each of these aspects of environmental contract's liability will reduce the total liability the contractor carries with it into the future. The limiting of liability over a shorter period of time after the contract is completed can relieve the contractor of excessive liability from previously completed contracts. The USAF must implement a method to reduce the liability of the environmental contractor or the number of contractors will remain small, weakening competition and causing an increase in the overall cost of environmental restorations.

Contract Management. Contract management can either be accomplished in-house or by contract. The amount of contract management varies depending upon the method of compensation used in the contract. The move to cost-reimbursement contracts has forced an increased emphasis on cost validation. The larger federal agencies (EPA, DOE, etc) have had trouble auditing the costs of their environmental contractors due to manpower constraints. This situation has caused the agencies problems and must be scrutinized by the Air Force. The Air Force must ensure that there are competent professionals and that they have the time available to ensure proper cost accounting.

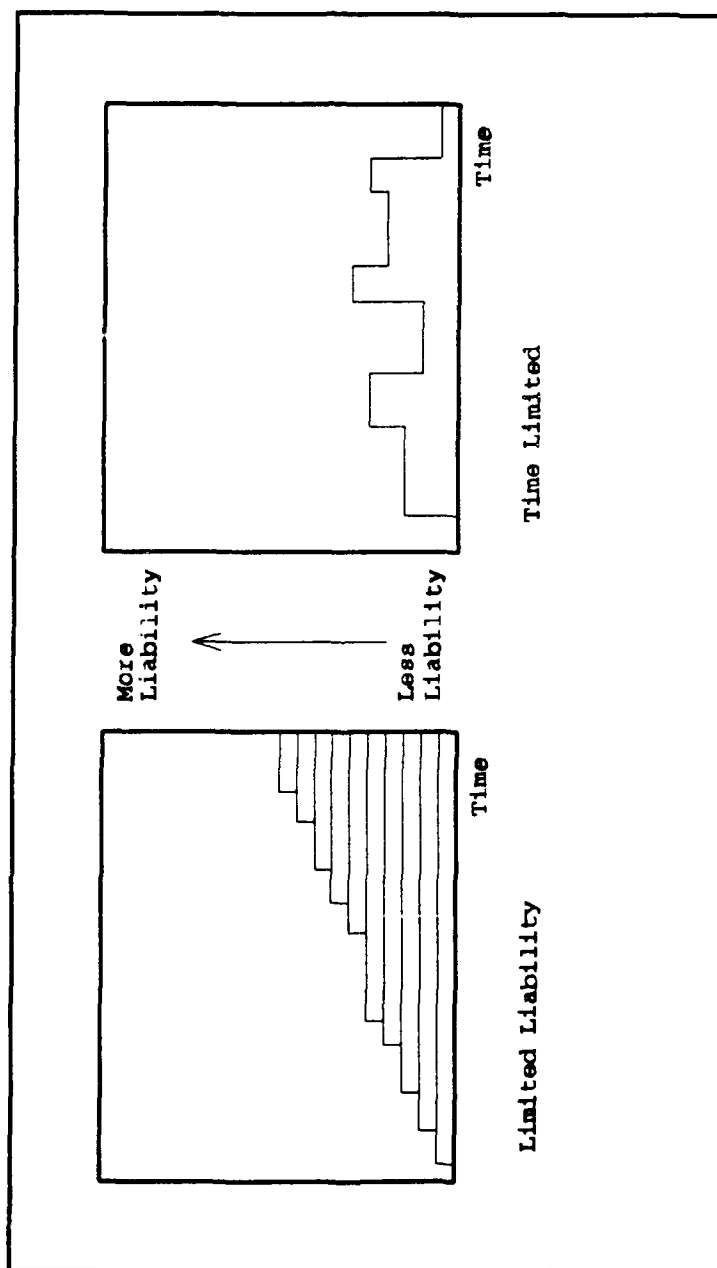


Figure 7. Methods of Indemnification

Recommendations for contract management include the ability to determine who should accomplish the task. The decision to use either in-house or contracted personnel for contract management should be based on more than the cost criteria. The expertise and availability of personnel is important. The Air Force must ensure proper contract management cost auditing to ensure the costs of the cost-reimbursement contracts are authorized. To accomplish this the Air Force must maintain the personnel with the necessary expertise or move to a contract that provides A&E Title II services.

Further Research

An important aspect of this thesis is the follow-on research needed to address the future of environmental contracting in the USAF. The following are suggested research topics for future theses.

Indemnification. Indemnification is very critical to the environmental contract of the future. The cost-reimbursement contract fully allows the cost of liability insurance for the remedial action contractor. This cost along with the additional impact of limited competition could drive the cost of the remedial action contract to significant increases. Research comparing the costs of similar remedial actions, that use similar acquisition strategies could clarify the impact of indemnification on remedial action projects.

Successful Completion Criteria. To further study the field of environmental contracting, there must be guidelines on what factors will influence the success of a remedial action contract. Many believe that a contract is successful if a quality end result is obtained within the cost and time constraints of the contract documents. In environmental contracting, health and safety issues, public relations, and social aspects also become involved. A survey of contracting officers, environmental managers, environmental engineers, surety agencies and regulatory bodies could produce the criteria that would define a successful remedial action contract.

Best Acquisition Strategy. Once the definition of a successful environmental contract is established, a comparison of different acquisition strategies could be completed. For a specific situation, the acquisition strategy could be defined prior to preparing contract documents. This analysis would require a multicriteria analysis method.

Appendix A: Glossary

There are numerous contracting and environmental terms that were used throughout this study. Below are the terms as defined in the FAR and its Supplements and other pertinent regulations and references:

Acquisitions. The acquiring by contract with appropriated funds of supplies or services (including construction) by and for the use of the Federal Government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract. (15:2.1)

Bid. Normally implies a response to a customer-initiated request for proposal or quotation: may be either competitive or of single-source nature. In past years, a bid was usually simpler in documentation requirements than a proposal. However, in current usage the term bid is often used synonymously with a proposal. (34:21)

Bidder. (General Definition) One who makes a bid. One who offers to pay a specific price for an article offered for sale at a public auction or to perform a certain contract for a specific price. (Government Definition) Any offeror bidding pursuant to an invitation for bids (IFB) or a request for proposal (RFP). (7:14)

Bond. A written instrument executed by a bidder or contractor (the "principal"), and a second party (the "surety" or "sureties"), to assure fulfillment of the principal's obligations to a third party (the "obligee" or "government"), identified in the bonds. If the principal's obligations are not met, the bond assures payment, to the extent stipulated, of any loss sustained by the obligee. The types of bonds and related documents are as follows:

- a) An advance payment bond secures fulfillment of the contractor's obligations under and advance payment provision.

b) An annual bid bond is a single bond furnished by a bidder, in lieu of separate bid bonds, which secure all bids (on other than construction contracts) requiring bonds submitted during a specific government fiscal year.

c) An annual performance bond is a single bond furnished by a contractor, in lieu of separate performance bonds, to secure fulfillment of the contractor's obligations under contracts (other than construction contracts) requiring bonds entered into during a specific government fiscal year.

d) A patent infringement bond secures fulfillment of the contractor's obligations under a patent provision.

e) A payment bond assures payments as required by law to all persons supplying a labor or material in the prosecution of the work provided for in the contract.

f) A performance bond secures performance and fulfillment of the contractor's obligations under the contract. (15:28.001)

Cleanup. "Actions taken to deal with a release or threatened release of hazardous substances that could effect public health and/or the environment. The term 'cleanup' is often used broadly to describe various response actions or phases of remedial responses such as the remedial investigation/feasibility study." (48:D-1)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). "A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and cleanup abandoned or uncontrolled hazardous waste sites." (48:D-2)

Construction. Construction, alteration or repair (including dredging, excavating, and painting) of buildings, structures, or other real property. For purposes of this definition, the terms "buildings, structures, or other real property" include but are not limited to improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, cemeteries, pumping stations, railways, airport facilities, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, and channels. Construction does not include the manufacture, production, furnishing, construction, alteration, repair, processing or

assembling of vessels, aircraft, or other kinds of personal property. (15:36.102)

Contract. A mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the government to an expenditure of appropriated funds and that, except as otherwise authorized, are in writing. In addition to bilateral instruments, contracts include (but are not limited to) awards and notices of awards, job orders, or task letters issued under basic ordering agreements; letter contracts; orders, such as purchase orders, under which the contract becomes effective by written acceptance or performance, and bilateral contract modifications. Contracts do not include grants and cooperative agreements covered by U.S.C. 501 et. seq.. (15:2.1)

Contract Clause(s). Term or condition used in contracts or in both solicitations and contracts, and applying after contract award or both before and after award. (15:52.101(a))

Contracting. "Contracting" means purchasing, renting, leasing, or otherwise obtaining supplies or services from nonfederal sources. Contracting includes description (but not determination) of supplies and services required, selection and solicitation of sources, preparation and award of contracts, and all phases of contract administration. It does not include making grants or cooperative agreements. (15:2.101)

Contracting Officer. A person with the authority to enter into, administer and/or terminate contracts and make related determinations and findings (15:2.1). Contracting officers have such authority over contracts and make related determinations and may bind the government only to the extent of the authority delegated to them. An agency head may establish contracting activities and delegate to heads of such contracting activities broad authority to manage the agency's contracting functions. Contracts may be entered into and signed on behalf of the government only by contracting officers. In some agencies, a relatively small number of high level officials are designated contracting officers solely by virtue of their positions (FAR 1.6). In the federal government, contracting officers are appointed in writing on a "Certificate of Appointment," Standard Form 1402 which states any limitation on the scope of authority to be exercised. Similarly, termination of a contracting officer appointment is by letter, unless the Certificate of Appointment contains other provisions for

automatic termination. However, no termination may operate retroactively. (15:2.1,1.6)

Contractor. Any individual or other legal entity that (a) submits offers for or is awarded, or reasonably may be expected to submit offers for or be awarded, a government contract or a subcontract under a government contract or (b) conducts business with the government as an agent or representative of another contractor. (15:9.403)

Cost Contracts. A cost-reimbursement contract in which the contractor receives no fee. It may be appropriate for research and development work, particularly with nonprofit educational institutions or other nonprofit organizations, and for facilities contracts. (15:16.302,16.301)

Cost Reimbursement Contracts. Types of contracts which provide for payment of allowable incurred costs, to the extent prescribed in the contract. These contracts establish an estimate of total cost for the purpose of obligating funds and establishing a ceiling that the contractor may not exceed (except at its own risk) without the approval of the buyer. They are suitable for use only when uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed-price contract. (15:16.301-1)

Davis-Bacon Act. This act cover contracts in excess of \$2000 for construction, alteration, or repair within the US. It states that no laborer or mechanic shall receive less than prevailing wage rates as determined by the Secretary of Labor.

Decision Document (DD). A means of recording significant decisions in the IRP. Steps or stages which merit a Decision Document include: selecting a remedial action, initiating long-term monitoring, initiating a removal action, closing out a site, and reactivating a site. Decision Documents may be used for both NPL and non-NPL sites. (10:A-2)

Defense Environmental Restoration Account (DERA). DERA is an account of money used for clean up of active, inactive, formerly-used DOD lands, and lands and resources affected by DOD releases of hazardous substances.

Defense Environmental Restoration Program (DERP). The Department of Defense program, mandated in SARA Section 211, which includes the Installation Restoration Program as a component. (10:A-2)

Delivery Order. Any purchase order, contract, shipping or other instruction calling for delivery of any material or product, or performance of construction or services, on a particular date or dates or within specified periods of time. (15:12.301)

Descriptive Specifications. A detailed written description of the required properties of a product, material, or piece of equipment and the required workmanship to install it. Describe in detail what is desired and how to make it operational.

Environmental Effects Abroad of Major Federal Actions (Executive Order 12114). The purpose of this Executive Order is to enable officials of Federal agencies responsible for authorizing and approving actions abroad to be informed of local environmental considerations. These considerations must be taken into account, along with considerations of national policy, in making decisions regarding such actions. (11:80)

Federal Compliance with Pollution Control Standards - Presidential Cleanup Order (Executive Order 12088). A 1978 E.O. from President Carter requiring all federal facilities to comply with laws dealing with toxic and hazardous wastes. The head of each Executive agency is responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency. (11:79)

Full and Open Competition. When used with respect to a contract action, means that all responsible sources are permitted to compete. (15:6.003)

Hazardous Ranking System (HRS). A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use the HRS to calculate a site score, from 0 to 100, based on the potential release of hazardous substances from a site through air, surface water, or ground water to affect people. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List (NPL). (10:A-4)

Hazardous Substance. "Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive." (48:D-3)

National Environmental Policy Act of 1969. (NEPA) (Public Law 91-190) Declares a national policy which will encourage productive and enjoyable harmony between man and his environment, establishes the Council on Environmental Quality, and states the requirements for EAs and EISs. (11:81)

National Oil and Hazardous Substances Contingency Plan. (NCP) Codified in 40 CFR 300. The NCP establishes procedures and standards for responding to releases of hazardous substances, pollutants, and contaminants. (11:81)

National Priorities List (NPL). The list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response. Non-federal sites can be cleaned up using money from the Trust Fund but not federal sites. The list is based primarily on the score a site receives on the Hazard Ranking System (HRS). (10:A-5)

Offer. "Offer" means a response to a solicitation that, if accepted, would bind the offeror to perform the resultant contract. Responses to invitations for bids (sealed bidding) are offers called "bids" or "sealed bids"; responses to requests for proposals (negotiations) are offers called "proposals". (15:2.210)

Offeror. "Offeror" means, in contracts, the party who makes the offer and looks for acceptance from the offeree (usually the contracting office/officer). (3:1082)

Operation and Maintenance (O&M). "Activities conducted at a site after a response action occurs, to ensure that the cleanup or contaminant system is functioning properly". (48:D-4)

Performance Specifications. A statement of required results, with the proper criteria for verifying compliance, but without unnecessary limitations on the methods for achieving the required results.

Potentially Responsible Party (PRP). An individual(s) or company(ies) (such as owners, operators, transporters, or generators) potentially responsible for, or contributing to, the contamination problems at a Superfund site. (10:A-6)

Preliminary Assessment/Site Inspection. The PA includes collecting and reviewing available information (reports, installation records, employee interviews, technical data, etc.) about a known or suspected hazardous waste site or release. The SI consists of a physical inspection of the

identified site, and in some cases, limited sample collection. (11:38)

Proprietary Specifications. Specifications identify the desired product by manufacturer's name, brand name, model number, type, and other characteristics.

Protection and Enhancement of Environmental Quality (Executive Order 11514). Established the policy for federal agencies to initiate measures needed to direct their policies, plans, and programs so as to meet national environmental goals. (11:79)

Record of Decision. (ROD) The ROD is the document that formally explains the final clean up alternative that will be implemented on a particular site. It takes into consideration public comments on the proposed plan and community concerns. (37:3)

Reference Specifications. The requirements are set by authority (eg. National Electric Code, National Fire Protection Association Standards, Plumbing Code), custom, or general consensus and are established as accepted criteria.

Remedial Design/Remedial Action (RD/RA). The RD is an engineering phase that follows the record of decision when technical drawings and specifications are developed for the subsequent remedial action at an IRP site. The RA is the actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at a site on the National Priorities List." (48:D-5)

Remedial Investigation/Feasibility Study (RI/FS). These steps may be conducted concurrently. The RI consists of sampling and field studies whose goals are to determine the nature and extent of contamination at a site and the direction and rate of migration, if applicable. Such information is necessary to define the alternative actions in the FS. The FS is used to develop and analyze various remedial alternatives and recommend appropriate actions. When an action has been chosen, a Record of Decision is written to document the choice. (11:38)

Remedial Project Manager (RPM). The Air Force official responsible for overseeing remedial response activities at AF IRP sites in accordance with the NCP Section E and Air Force policies. (10:A-7)

Resource Conservation and Recovery Act of 1976. (RCRA) Calls for comprehensive regulation of designated hazardous waste from time of generation to disposal (cradle to grave). EPA regulates generators and transporters and issues permits for

treatment, storage, and disposal (TSD) facilities. EPA has broad enforcement powers including administrative orders, injunctive relief, civil fines, and criminal penalties. EPA can reach past disposal sites under Section 7003, if the site is an "imminent" hazard to health or environment. (11:83)

Responses to Environmental Damage (Executive Order 12316). Signed by President Reagan on 14 Aug 81. Delegates authority of the President under various provisions of CERCLA to federal agencies. Bulk of authority went to EPA; however, Secretary of Defense received authority with respect to releases from military installations. (11:80)

Safe Drinking Water Act. (1074) (SDWA) Established regulatory program to assure safety of the nation's public drinking water and water supplies. Program was designed to establish standards for acceptable levels of contaminants in drinking water, to allow enforcement of these standards by the states, and to protect drinking water supplies from underground injections. (11:84)

Service Center. An organization which can provide IRP technical expertise and contractor management support to the AF on the basis of a large "umbrella" contract or mandate. Examples of service centers used in the AF IRP are AFCEE, DOE, COE, TVA, and USGS.

Service Contract. A contract that directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply. A service contract may be either a non-personal or personal contract. It can also cover services performed by either professional or nonprofessional personnel whether on an individual or organizational basis. Some of the areas in which service contracts are found include the following:

- a) Maintenance, overhaul, repair, servicing, rehabilitation, salvage, modernization, or modification of supplies, systems, or equipment.
- b) Routine recurring maintenance of real property.
- c) Housekeeping and base services.
- d) Consulting services.
- e) Engineering and technical services.
- f) Operation of government-owned equipment, facilities, and systems.

- g) Communication services.
- h) Architect-Engineering.
- i) Transportation and related services.
- j) Research and development. (FAR 37.101)

Service Contract Act. This act covers service contracts over \$2500. They shall contain mandatory provisions regarding minimum wages and fringe benefits. Service contracts may not exceed 5 years. (15:37.101)

Site Inspection (SI). "A technical phase that follows a preliminary assessment designed to collect more extensive information on a hazardous waste site. The information is used to score the site with the Hazardous Ranking System to determine whether response action is needed." (48:D-7)

Specification. A description of the technical requirements for a material, product, or service that includes the criteria for determining whether these requirements are met. Specifications shall state only the government's actual minimum needs designed to achieve full and open competition, with due regard to the nature of the supplies or services to be acquired. (15:10.001)

Superfund. A common name used in the place of CERCLA, also known as the 'Trust Fund'. (48:D-7)

Superfund Amendments and Reauthorizations Act of 1986. (SARA) The amendments clarified may public participation questions and made federal facilities accountable under the statute. Reauthorization extends funding for five years. (11:84)

Superfund Implementation (Executive Order 12580). Signed by President Reagan on 23 Jan 87. Delegates authority and responsibility for execution of CERCLA/SARA provisions to the Secretary of Defense. (11:80)

Toxic Substances Control Act. (TSCA) Enacted by Congress in 1976 to regulate commerce and protect human health and environment by requiring testing and necessary use restrictions on certain chemicals and mixtures. With certain exceptions, all chemicals, whether or not "toxic", are covered. EPA can take a variety of regulatory actions governing testing, remanufacture clearance, production, and distribution of chemicals to protect health and environment form unreasonable risks of harm. (11:84)

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Vita

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Vita

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